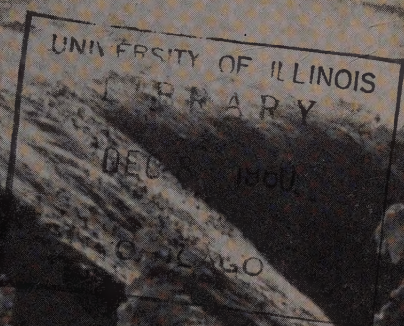


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(Stanley W. Stocker, formerly Camping Survey Director of the American Camping Association, Martinsville, Indiana, has written articles for *Appalachia* on equipment and supplies. The first of the series, "Foods for Trail and Camp," appeared in the issue of June, 1958. Quotation from *Appalachia*—June 15, 1959 issue, page 366.)

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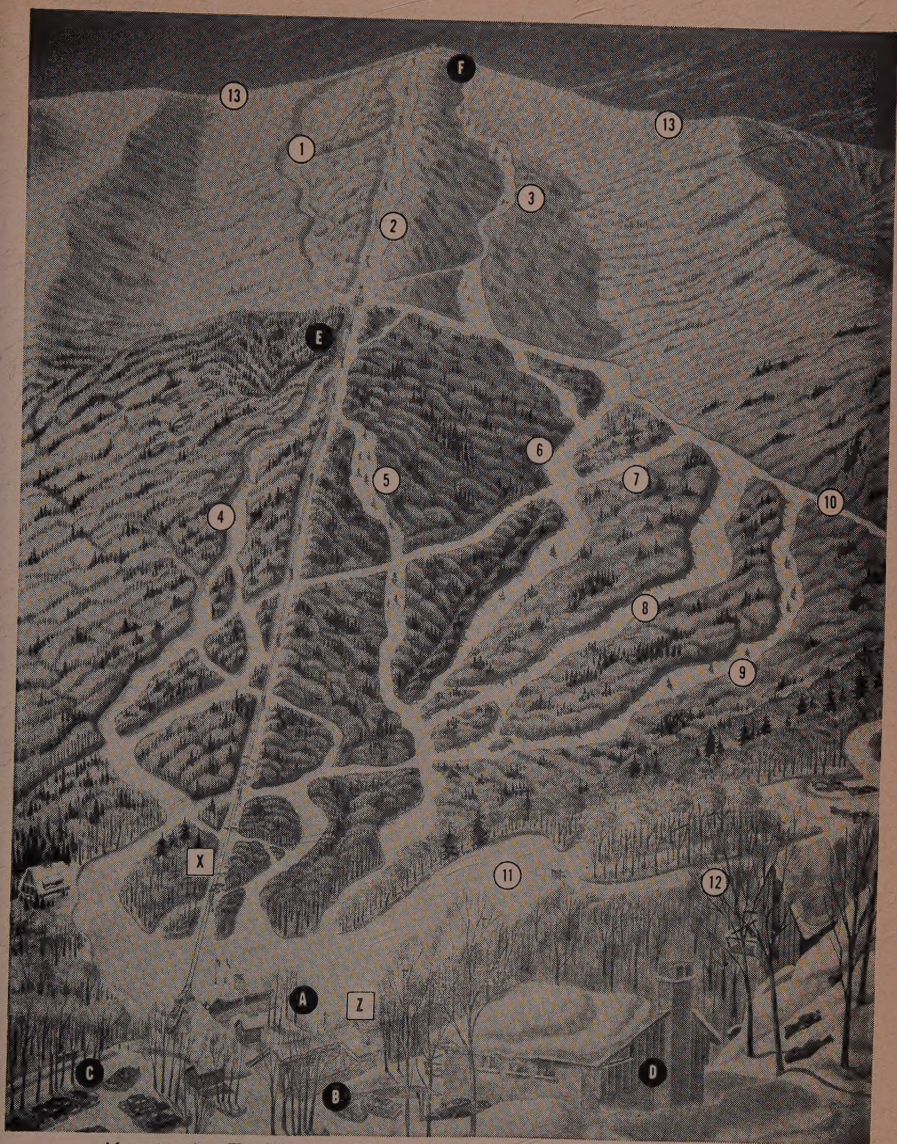
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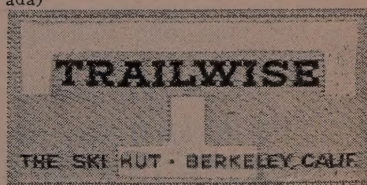
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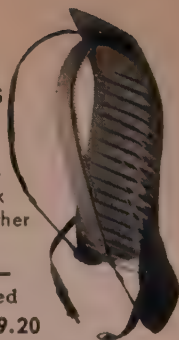
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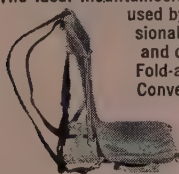


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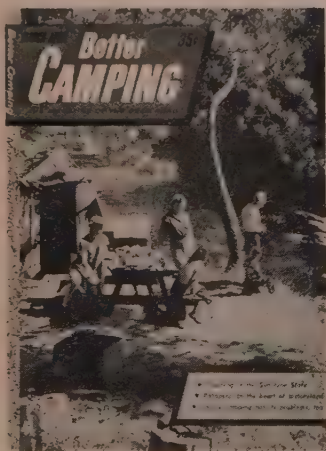
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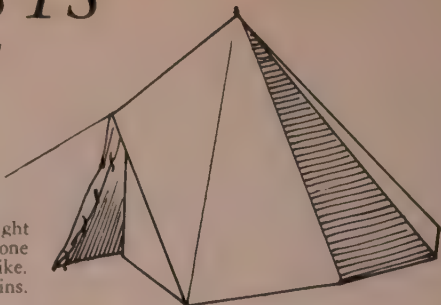
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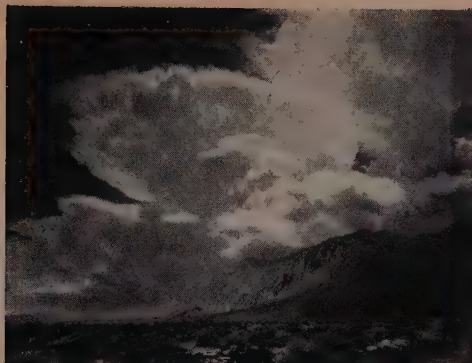
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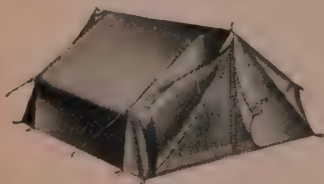
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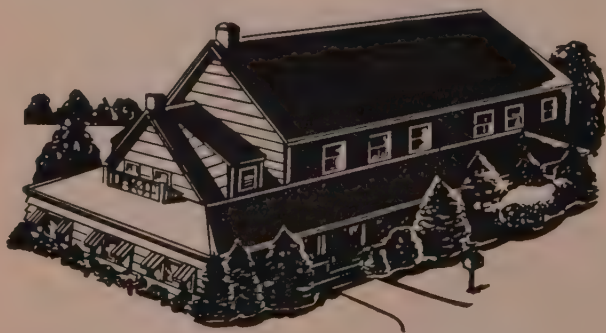
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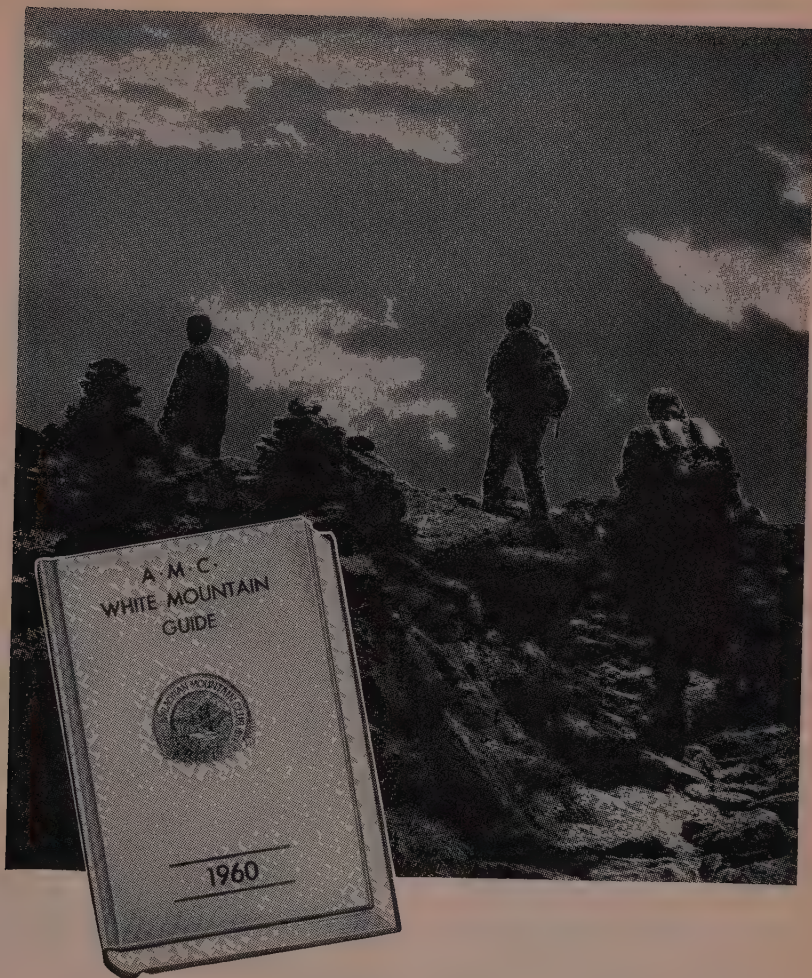
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It teaches the proper safety precautions for mountaineers and trampers, and arranges rescue parties for those in trouble.

It is active in the conservation of natural resources and the preservation of the wilderness.

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APPALACHIA

New Series, Volume XXVI, December, 1960

Number 12

MAGAZINE NUMBER 131

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For uniform binding, this issue constitutes No. 2 of Vol. XXXIII
and is numbered pages 145-288

APPALACHIA

DECEMBER 15, 1960

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Will F. Thompson

THE SHAPE OF NEW ENGLAND MOUNTAINS

by WILL F. THOMPSON

PART I

Introduction

TO THE DEGREE THAT ALPINE CLIMATES ARE MORE SEVERE than nearby lowland climates, it has always seemed reasonable that the processes of weathering and erosion (geomorphic processes) brought about by climate should be different and more vigorous at altitude (Penck, 1886-87). The fact that certain geomorphic theories and observations have indicated otherwise has always been surprising to students of the problem. For that reason the study of New England mountains is especially appropriate, since the records of the Mt. Washington Observatory show that they have an especially severe alpine climate. Nevertheless, geomorphologists have believed that the alpine uplands of those mountains have long been very resistant to weathering and erosion except during the most glacial climatic intervals of the Ice Age. Observations presented in this study will allow us to reach more nearly correct conclusions as a basis for comparison of New England mountain environment with that of mountains elsewhere.

Regionally characteristic mountain environments, still generally undescribed as such, do exist throughout the mountains of the world. Many of these regions are geologically varied, yet have

WILL F. THOMPSON, a member of the Club, is a physical geographer at present attached to the Army Quartermaster Research and Engineering Command at Natick, Mass. His specialty is the physical geography of mountains. Besides devoting several years to graduate work in different universities he has engaged in field studies in the Rockies, the Cascades, and the mountains of Alaska, including the Aleutian Islands. The present article, which will appear in three instalments, is based upon a thesis for the doctorate submitted at Clark University in this year. It advocates a new and interesting explanation of the geomorphology of the White Mountains and Katahdin.

Opposite. The southwest ridge of Katahdin has been modified very little by either alpine or continental glaciers. Moderated slopes in the alpine zone have been shaped by mass wasting processes (solifluction and felsenmeer creep) which were dominant there long before glacial times. The great power of alpine mass wasting in New England mountains, relative to that of the subalpine zone, is due to violent westerly winds which sweep off most of the snow and allow frost to penetrate deeply the bouldery surface. Streams remain dispersed on the alpine surface because incipient channels become filled with frost-moved boulders.

In the snowy subalpine zone frost is also effective, but only because drainage (water, snow or ice) has been able to concentrate in channels and thus undercut and steepen the subalpine slopes. Less frost heave is necessary to cause mass wasting of such steep slopes.

a distinctive and consistent type of mountain landscape because of their climatic homogeneity. The Alps are one example of this, and the mountains of our southwestern desert regions are another of a very different kind (Logan and Gaines, 1956). The great similarity of mountainous fiord-coast landscapes in Norway, Alaska, Chile, and New Zealand is due to their closely analogous climates.

The object of this study is to establish a sensitive method of defining and describing such regions. Lowland climatic regions are regularly defined on the basis of instrumental climatic data, but such data are seldom available for the higher and more exposed parts of a mountain region. The complexity of mountain climate is such that, even if we had enough such data, it would be very hard to organize, and the variety recorded within any one region would obscure real and very significant differences between regions. Our description of the New England mountains as a climatic type will thus be in terms of the characteristic effect over the region of weathering and erosion, which are functions of climate, on their shape and surface conditions. The effect of climate on high-level vegetation will also be discussed. Variations in climate during the time in which the mountains have been shaped will be duly considered.

Because certain arguments used in this study place a new interpretation on the literature, as well as on field observations in mountains, many references are necessary. Those which may be of interest to New England climbers are marked by an asterisk in the bibliography.

Concepts and Controversies

The currently accepted geomorphic theories about New England mountains were developed by J. W. and R. P. Goldthwait in the course of a long and thorough study of the Presidential Range (1913, 1914, 1916, 1925, 1939, 1940, and 1951). The same theories should apply to Katahdin, the other outstanding mountain massif in New England, in view of its close similarity to the Presidentials. The theories are most completely presented in R. P. Goldthwait's dissertation (1939) and are merely restated in later Goldthwait publications. The Goldthwaits considered the Presidential Upland (the alpine zone of the Presidential Range, familiar to New England climbers) to be a remnant of an ancient erosion surface of moderate relief, shaped at a low elevation and then uplifted, ages ago, on the crest of the mass from which the White Mountains have been carved. Later dissection of the mass was mostly by river valleys, which have recently been somewhat modified by glacial erosion. The Goldthwaits believed that such dissection had eventually destroyed all but a small

part of the ancient uplifted surface. The valleys were not simply cut by rivers, but also widened simultaneously by other processes which the Goldthwaits considered effective on the steep valley walls but not on the inherited low gradients of the alpine uplands.

Sometime during the Pleistocene local (alpine) glaciers formed in certain subalpine gorge-heads which were well located to catch and accumulate snow drifted off the Presidential Upland by the violent westerly winds which still prevail there (Brooks, 1940). Similar glaciers became somewhat larger and more widespread on Katahdin. The cirques they carved (valley-head glacial amphitheatres like Tuckerman Ravine) are the most spectacular feature of the two massifs. The best cirques are on eastern (lee-ward) and northern (shadowed) slopes. At least once during the Pleistocene both ranges were completely submerged by a vast continental glacier which covered the whole region and interrupted the distinctive work of the alpine ice. The Goldthwaits were unable to find any convincing evidence that alpine glaciers ever formed again in the Presidentials after the last interruption, though many of the cirques in that range remain quite steep and sharply defined.

On the other hand, R. S. Tarr (1900) found excellent evidence of vigorous post-continental alpine glaciation on Katahdin. Only R. P. Goldthwait has questioned his findings, mostly on the strength of pebble counts which can hardly be considered adequate samples, considering the nature of the ground. D. W. Johnson (1917, 1933) was highly critical of the Goldthwait position on post-continental alpine glaciers and cited several possible moraines (masses of detritus believed to be directly deposited by a glacier) below relatively obscure cirques, less favorable to ice accumulation than those of the Presidentials. Naturally, Johnson's "moraines" were less substantial and convincing than those of Tarr, but no other explanation of their origin has ever been published.

A more fundamental controversy arose from J. W. Goldthwait's suggestion (1914) that the parts of the Presidential Upland known as "lawns" (alpine surfaces having relatively slight slope, such as Bigelow Lawn and the Alpine Garden) might be uplifted parts of the New England Peneplain, an ancient erosion surface described earlier in southern New England by W. M. Davis. Because most of New England was once a fairly level river-cut lowland, which has since been moderately uplifted and carved into valleys, it is possible to stand on any ordinary New England bedrock hilltop, away from the coast, and see around one a level line of closely matching (accordant) hilltops representing the old surface (the peneplain). Its slope is very slight and it extends across most of the region.

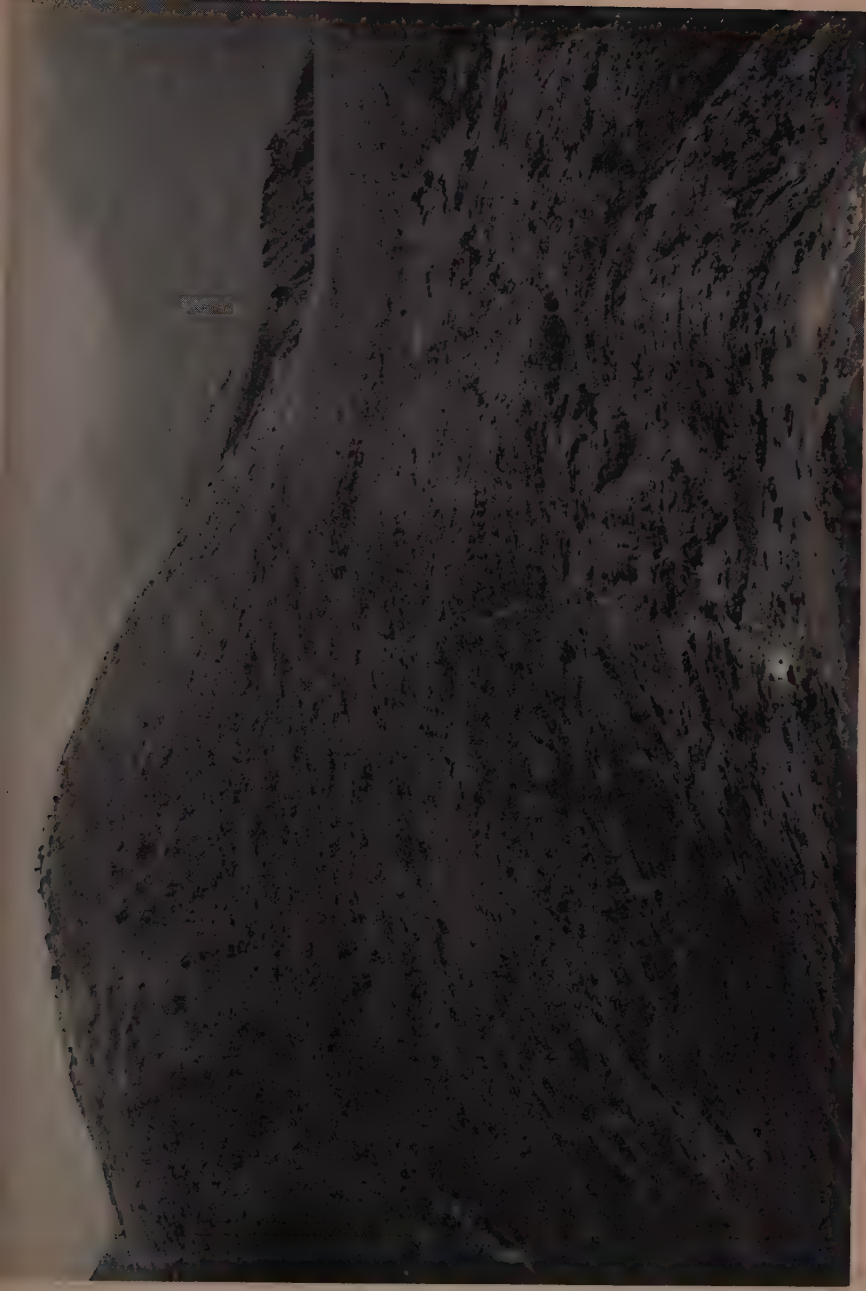
Monadnock, Katahdin, and many other outlying summits, as well as the White and Green mountains, definitely rise above the peneplain and apparently always have. Thus, A. K. Lobeck, working from topographic maps as well as in the field, was able to prove the presence of the undistorted peneplain so far north among the fringes of the White Mountains that no possibility remained that it could have been upwarped to form a summit upland. Though the Goldthwait theory of the origin of the Presidential Upland is directly derived from Davis' peneplain concept, the Goldthwaits not only accepted Lobeck's conclusions, but R. P. Goldthwait also noted that no accordance of summits exists in the White Mountains. This did not keep them from maintaining that the Presidential Upland is an old uplifted erosion surface, but it did discourage description of it as an actual peneplain. It also placed the presumed date of uplift far back in geologic time, since it had to be older than the New England Peneplain, which was probably completed in the early Tertiary.

That an uplifted surface subject to a severe frost climate should retain any hint of its original form for so long seems incredible today. However, the Goldthwaits were influenced not only by the peneplain concept but also by observations on the lichen cover of the Upland, which seemed to demonstrate great stability of its surface. Misled by the lichen-cover argument, Ernst Antevs (1932) described the coarse patterns formed by frost heave in the boulder mantle of the Presidential Upland as "fossil" relics of a brief period of especially severe climate immediately following continental deglaciation. Though the frost patterns are fresh-appearing in all other respects, and the boulders seem equally weathered on their sheltered and exposed surfaces, only their exposed sides have lichens. New lichens are believed to appear on overturned stones only with extreme

Opposite. This is the largest area in New England of moderated alpine slopes remaining undissected. The Goldthwait-Antevs theory that such slopes are stable and inert under present climate was based in part on the great uniformity of lichen cover on this surface (see text). Note, on the other hand, the dynamic pattern and apparent freshness of the gross frost patterns on the cone. The east face of the cone (Fig. 2) shows much greater disturbance of surface boulders and lichens.

In spite of heavy precipitation (70 inches on the summit), stream channels have made little headway on the alpine surface because it is strongly frost-stirred. Glacially abraded alpine surfaces, once wide spread, remain unshattered only on the Lakes of the Clouds col (foreground), where strong ice flow removed nearly all weak rock, and where alpine climate is least severe because the altitude of the upland is least.

Note that the Alpine Garden "lawn" surface (upper right) seems to have been continuous with similar surfaces in the foreground until they were separated by the headward advance of Tuckerman Ravine (to the right of the cone).



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Fig. 1. THE CONE AND SOUTHERN LAWNS OF MOUNT WASHINGTON



slowness, yet over large areas of the uplands there are almost no examples of lichen-free boulders. Moreover, cairns and stone walls on the uplands have in some cases stood undisturbed for decades. This evidence of apparent surface stability was so unexpected in view of the prevailing alpine climate that J. W. Goldthwait and many later students were forced to believe that the boulder-mantle of the upland is a highly effective protective layer capable of preserving it through geologic ages.

R. P. Goldthwait's thorough and scholarly presentation of the concepts discussed above was so strengthened by inclusion of Antevs' observations that no serious counter-argument has ever been published. In the meantime, however, our understanding of the mechanics and importance of frost action has far outrun that of Antevs in 1932. Before presenting further observations from New England, it will be helpful to discuss the effect of climate on the shape of mountains elsewhere in the world, in order to have standards by which to judge New England mountain environment.

Alpine Peneplains

Katahdin, the Presidentials, and the Shickshocks (Flint, Demorest and Washburn, 1942) all rise quite steeply to the treeline and are truncated near or above that level by the distinctly more

Opposite. This face of Mt. Washington approaches more closely than any other locality in New England the situation characteristic of the Alps in which moderation of slopes at timberline is accentuated by the collection on those slopes of drainage (water and snow) from steeper slopes above.

Scrub conifers (dark areas) growing almost to its summit are evidence that this face of the cone of Mt. Washington is less windswept than others. Being thus somewhat protected from the severity of alpine frost by winter snow, it is able to stand more steeply than the other faces. Actually, the slope of the cone seems to have been somewhat oversteepened by processes active at its base and its boulders are therefore overtaken by frost very frequently. Consequent loss of lichen cover is indicated by the bright tone of the slope.

Snowdrifts at the base of the cone provide ample thaw water for vigorous mass-wasting and other erosion on the surface of the low-gradient Alpine Garden lawn, which traverses the mountainside at the base of the summit cone. Fine material washed down from above is moved actively across the lawn surface by solifluction and by water streaming among the boulders. Solifluction and felsenmeer creep also move the coarser materials vigorously, so that stream channels are unable to form on the lawn. It is undercut on its downslope margin by the advance of subalpine gorges such as Tuckerman and Huntington Ravines (left and right). They are glacial cirques formed by snow drifted from the upland. Raymond Cataract (center) drains a stream-cut basin severely limited in its headward extension by an overload of coarse detritus supplied from above by mass-wasting.

moderate slopes of their alpine uplands. Other peaks in the region have similar tendencies but do not rise high enough to have such extensive alpine uplands. Moderated slopes above timberline are also quite usual elsewhere in the world. Summit accordances (a number of summits of closely matching height) are equally widespread. Both have sometimes been considered evidence of peneplains or other uplifted ancient erosion surfaces.

The belief (Penck, 1886-87) that weathering and erosion must become more vigorous with increasing altitude throws serious doubt on such long preservation of alpine peneplains. However, we have seen that real peneplains can persist at lower elevations. They got considerable attention as "fossil" features early in this century when information from fossils was forcing great philosophical adjustments on the world. Thus, the first movie version of Conan Doyle's "Lost World" fantasy placed its living dinosaurs on a cliff-encircled "peneplain", a dramatic table-like summit in the Guiana Highlands. Actually, even lowland peneplains are not "fossil", but are instead an inherited disturbance of the energy flow in the landscape, to which the surface responds in much the same way that a water surface does to the wake of a boat long passed by.

The intellectual attraction of the peneplain concept was once such that when U. S. Geological Survey publications by I. C. Russell (1900) and Willis and Smith (1903) called attention to what seemed to be a remarkable example of an alpine peneplain in the Cascade Mountains, a prior explanation by Dawson (1896) was simply disregarded, not because of any lack of logic, but evidently merely because of the apparent potentialities of the peneplain concept. Willis and Smith actually admitted that they could not explain the widespread coincidence of their "peneplain" with timberline, though Dawson already had done so. Nevertheless, they persisted in their theory. Richter's observations (1896) in Norway, where the same thing occurs, were also disregarded. The Cascade Peneplain papers set a precedent for other studies, including those of the Goldthwaits, in spite of Daly's presentation of several alternative causes of summit accordance (1905), and his field evidence against the Cascade Peneplain itself (1912).

W. M. Davis admitted in 1899 that especially active geomorphic processes "at 5,000 or 6,000 feet" could have truncated the White Mountains just as Richter said the Norwegian mountains had been truncated. Nevertheless, ignoring criteria for peneplains which he had set up himself, he wrote in APPALACHIA in 1904 that a range in the Tian Shan, which he had seen only from a distance, had "an exceptionally fine alpine peneplain". By 1938 Atwood and Atwood were able to summarize and defend a number of descriptions of alpine peneplain remnants through-

out the Rockies. The Flattop summit surface in Rocky Mountain National Park, which they considered typical of such remnants, has topography and surface phenomena (including a frost-patterned boulder mantle over most of its surface) which are strikingly similar to those of the New England alpine uplands, except for certain effects of continental glaciation on the latter.

Other considerations, added through several decades to Daly's arguments, gradually brought alpine peneplains into disrepute, though the earlier concepts of Penck, Dawson, and Richter remained subject to certain objections, also. Penck noted in 1919 that the Tertiary peneplain supposedly responsible for certain widespread high-level summit accordances (gipfelfluren) in the Alps had been given a date which was actually a time of high relief in that range. During this period, the mountain flanks accumulated thick deposits of detritus so coarse that it can have been laid down only by mountain torrents. The drainage from a peneplain could have brought only fine silts. In 1947 Mackin presented similar evidence from the Rockies, citing at the same time R. J. Russell's summary (1933) of geomorphic processes which must long ago have destroyed any remnants of an alpine peneplain if one had existed. It would be a bold geologist who revived the concept of alpine peneplains in either range today, yet the Goldthwait theory for the Presidential Upland is essentially the same and is still generally accepted.

The Moderation of Alpine Slopes

Richter (1896) credited local small glaciers, such as exist there today, with the striking development of moderated alpine slopes in the mountains of Norway. His argument was vulnerable because of the delicacy of the climatic balance required to keep the right kind of small glaciers active at the right altitude long enough to produce the observed effect. Dawson (1896), working in the British Columbia Coast Range and the adjacent Cascades, noted a widespread and very prevalent accordance of ridge crests and minor summits at timberline in those ranges. He explained it as due to a difference in the rate of weathering and erosion above and below treeline because of the stabilizing root-mat of the subalpine forest. Daly, writing in 1912 in support of Dawson's concept, noted that the truncating processes had also moderated the slopes of meadows at timberline on the faces of high peaks not yet truncated. The most important moderating processes in the Cascades are frost-caused creep and slow flow of the meadow soils (solifluction). Small glaciers are also active in places at or near that level, as they are in Norway, but are not controlled by timberline.

Alpine solifluction in the Cascades is quite different from frost action at alpine and subalpine levels in Rocky Mountain

National Park, or on New England mountains. The latter regions have such wide seasonal temperature ranges that frost strikes deeply into the ground below the roots of subalpine timber, which thus has little power to keep the slopes from creeping. On the other hand, Cascade temperature ranges are moderate and timberline soils in that region are protected during its wet winters by vast depths of snow. Frost is especially vigorous and effective on Cascade timberline meadows while the slopes are saturated by melt water in spring. It does not penetrate deeply into the ground except on windswept high-alpine ridges. Thus it is effective on the alpine meadows (alp slopes) but not under subalpine forest.

One argument frequently used against the Dawson-Richter explanation of alp-slope moderation is that variations in climate and in the height of timberline have been so great, especially during the Pleistocene, that distinctive topographic effects caused by the climate of the timberline zone must in the long run have been diffused over a much broader range of altitude. The scale and especially the duration of Pleistocene climatic fluctuations are only vaguely known, however, and objections based on them must give way in the face of demonstrable realities.

The alp-slope zone in the Cascades is the picturesque timberline zone described by John Muir, first in the Sierras and then northward into Alaska. It has been familiar at first-hand and from photographs to thousands of people ever since. Climatic control of its topographic moderation is strongly indicated by the fact that it rises gradually and regularly, without regard for geologic factors, from about 1,000 feet on the mountainous shores of Prince William Sound in Alaska (Thompson, 1954) to about 10,000 feet in the High Sierra of California. Except on the seaward flank of the St. Elias Alps, the icefields of which generate cold winds, its landscape is much the same wherever the prevailing westerlies blow inshore in winter on that coast. Thus, the roles played at timberline by subalpine forest, isolated erect trees, stunted timber (*krummholz*), topographically moderated meadow slopes, and the talus slopes and cliffs which rise above them, are much the same from the Chugach to California, except that in parts of British Columbia and Alaska the alp slopes have been scoured by continental ice. The slowness with which the scoured surfaces have weathered indicates that the alp slopes have developed slowly and that their history is necessarily long.

Besides rising southward along the west coast, timberline and the alp-slope zone rise together regularly and substantially as one passes inland from the coast. The rise is due to the effect on tree growth of reduced snow depths and increased summer maximum temperatures. In spite of strongly continental climate, moderated slopes are present at timberline (12,000 feet) in the

snowy Gore Range in Colorado and are believed to be similarly developed on the western slope of the Wind River Mountains in Wyoming. They do not seem to occur on the east flanks of the Rockies, where snowfall is light and winter frost strikes deeply into the alpine surface.

The well-known alp slopes of the European Alps, the Pyrenees, and the mountains of Norway are like those of the Cascades. Boesch says of the Alps (1946): "The 'Zone of Flattening' displays in its course a behavior entirely similar to that of the climatically conditioned modern tree limit; that on the whole both levels not only take the same course today but definitely even seem to fall more or less together is naturally of decisive importance to alpine economic values". The relationship has been somewhat obscured in Europe by clearing for pasture and by fuel cutting. Furthermore, the Alps lack the great latitudinal extent and strong, simple, transverse climatic gradient which make climatic control of alp-slope development so evident in the maritime North American Cordillera from the Sierras north. However, the alp-slope level also coincides with the natural timberline in the Pyrenees and Norway, and the two decline northward together in Norway just as they do in southeastern Alaska. Conspicuous high-alpine summit accordances (*gipfelfluren*), both in the Alps and the Cascades, are probably due to uplift of ridges which were uniformly truncated at timberline long ago.

In ranges of sufficient height which are climatically similar to the Alps or to the Cascades, sharpened summits and high-alpine ridges characteristically rise steeply from the alp-slope zone, contrasting picturesquely with the moderated slopes of that belt and with the forested slopes, also generally steeper than alp slopes, which lie still further down. The sharpened crests are of special interest to us in view of the lack of such cliffed summits on the otherwise rugged Presidentials and Katahdin. Sharpened ridges such as the Knife Edge on Katahdin have been developed in New England by cirque cutting, but do not rise out of the alpine uplands because frost riving is too vigorous there. Only at levels close to the treeline do even those *roches moutonnées* which were most heavily abraded and highly polished by the continental ice remain unshattered on the New England alpine uplands. Shattering of the upper parts of the South Basin headwall on Katahdin has easily kept pace with the vigorous post-continental glacial erosion which has sharpened the Knife Edge above it.

Alpine frost is particularly active in New England because temperature ranges and precipitation are considerable and because violent winds sweep the snow off the alpine zone. The Rockies have wide temperature ranges and the Cascades have ample precipitation (and consequently deep protecting snow),

but neither has the two in combination. Sharpened alpine summits have thus formed in the Rockies and are even more prevalent in the Cascades. In those ranges, the steeper the summit the better drained it is and the less power frost has to destroy it. Moisture which would otherwise contribute to the vigor of frost action on the alpine crests drains off, either as streams or as avalanches, and contributes instead to the processes acting on talus slopes and alp slopes to undercut and sharpen the upper cliffs.

The Role of Wind in Alpine Geomorphology

A different but equally dramatic kind of climate-controlled geomorphic differentiation of the alpine and subalpine zones has occurred in the Aleutian Islands (Thompson, 1950) and in the Old Man Range of windy southern New Zealand (central Otago; personal communication by W. D. Billings, 1959). Though short-period frost is dominant there, hardly going deeper into the ground than on the Cascade alp slopes, a close parallel exists in some ways with geomorphic conditions on New England summits and in certain places in the Rockies. The similarities are due to wind.

The Aleutian situation was first described by the botanist Hulten (1934), who found the vegetation of those islands sharply divided into two kinds: alpine (mostly heaths, prostrate willows, and alpine herbs) and subalpine (grassland, like tall prairie, with herbs similar in aspect to those of such prairie, but with a mat of sphagnum beneath). The boundary between the two zones is sharp, both botanically and topographically, but like the White Mountain timberline it occurs at a considerable range of altitude according to exposure to wind. The windy slopes just above the line are usually topographically moderate; the relatively calm grassy slopes below are on the average much steeper. The contrast is due to stripping of the snow from the windy uplands, which are thus exposed throughout the winter to the mild but very frequent frosts characteristic of the islands. The frost causes solifluction and by breaking the alpine turf encourages sheet washing and wind erosion. On the other hand, the snowdrift-protected meadows below are little disturbed by frost. On Adak and Tanaga Islands they have accumulated clearly distinguishable alternate layers of blanket-bog peat (Pearsall, 1950) and volcanic ash, yet even the thinnest layers are sharp and unbroken by frost heave.

Billings describes the Old Man Range in New Zealand as having miniature frost patterns (polygons and stripes mostly less than two feet across, see Troll, 1941 and 1943-44) better developed on its topographically moderated alpine uplands than is usual in the Aleutians. Its lower slopes are timbered, but timberline has no topographic expression because the antarctic ever-

green beeches are unable to grow as high as the associated sub-alpine meadow grasses. The meadow turf is able to stabilize the relatively steep upper-subalpine slopes because it is protected from frost by snowdrifts, whereas the alpine slopes are swept clear by wind. A marked break in slope has consequently developed between the two.

Similar contrast has developed in New England between a windswept and thus topographically moderated alpine zone and a steeper snowdrift-protected subalpine zone, though frost is only somewhat less active in the latter. "Summit surfaces" remarkably similar to the New England alpine uplands have developed in the Rockies. The mass-wasting processes involved are in both cases largely those characteristic of felsenmeers (boulder mantles like those of Katahdin and the Presidentials) and have been little known previously.

Felsenmeer Creep and Its Significance

Appreciation of the role and significance, in arctic and boreal climates and their mountain equivalents, of a group of geomorphic processes known as mass wasting, has been increasing steadily since the turn of the century. (Andersson, 1906; Sharpe, 1938; Troll, 1941, 1943-44, 1948.) Mass-wasting processes are those geomorphic processes which require no suspending medium (air, water, or ice) to carry their detritus load. Sharpe divided such processes into forms of creep and slip. Frost is generally considered to cause creep rather than slip, and has always been assumed to be most intense at the surface. Thus, solifluction is generally believed to be most rapid at the surface and to cause maximum disturbance there, as the Goldthwaits originally expected on the Presidential Upland.

However, Taber (1929) demonstrated that frost heave can occur only in the presence of fine soil, whereas the boulder mantle of the Presidentials and Katahdin is open-jointed. Water does not expand enough on freezing to disturb such open rubble significantly. In fine soils, however, super-cooled water moves through capillary pores even at temperatures well below freezing, so that frost crystals grow during the winter into large segregated ice masses which exert powerful mechanical thrusts.

The term applied through the world to boulder mantles such as those of alpine New England is "felsenmeer". Felsenmeers are rubble mantles which are consistently open-jointed at or near the surface. There is always a layer of stone-filled fine soil beneath them, however, formed at least in part by the weathering of the overlying blocks. It has always been assumed that this underlayer is more or less protected from frost by its position. That this might not be true became apparent to the writer at Camp Hale, Colorado, in June 1955.

Subalpine and alpine felsenmeers in that vicinity appear on airphotos to have formed "runs" like those formed by a poor grade of paint, though on a vast scale. The cause of the creep became evident when excavation of such a slope 2,500 feet below timberline uncovered a deep layer of stony, muddy ice about five feet below the surface throughout its area. The ice can only have been formed from spring thaw-water and had persisted through most of the warm summer characteristic of that locality (Thompson and Dodd, 1958). The explanation arrived at then was later found to have been put forward to explain the formation of ice in caves, first by Browne (1865) and Truillet (1885) and then in great detail by Balch (1897 and 1900).

Any rock-walled cavity opening upward will set up a circulation of air if the outside atmosphere is colder than its walls. Warmed air moves upward and is replaced by air descending from the surface. In winter, the descending air is often drawn from the immediate surface and may have been cooled by surface radiation until it is substantially colder than air even a few feet above the surface. In any severe climate, therefore, caves and crevices opening upward will tend to get very cold during the winter. In summer, air lying within them remains colder and heavier than outside air and is thus stable, resisting ventilation. Thaw-water enters the refrigerated cavities in spring and forms soil frost; later in summer it slowly thaws. We may consider our felsenmeers an extreme case of that "growth" of boulders, because of frost heave, which rendered upland farming in New England uneconomic. The upheaved boulders of the felsenmeers form an open-jointed mass overlying the soil, so that it is cooled very efficiently by Balch ventilation, the process described above.

The large amount of soil frost which is consequently formed causes creep which is equivalent to solifluction, though its force is exerted only in the silty, stony underlayer and not near the surface. There are many reasons to believe that soil-frost formation and the resulting creep are very active on the New England alpine uplands. A bedrock well on the summit of Mt. Washington has freezing temperatures (permafrost) for 300 feet down from the surface (J. G. Ricker, Mt. Washington T. V., Inc.). An-

Opposite. Like other ravines in New England mountains not so located as to have accumulated quantities of drifted snow from nearby alpine uplands, this ravine on the west slope of the Presidentials retains the characteristics it had before the Ice Age. It was never broadened into a cirque like Tuckerman Ravine (Fig. 2). Its streams must not only deepen it, but must also carry away great masses of bouldery detritus dumped into them by mass-wasting (mostly creep and landsliding). Hence the steepness of the upper tributaries, which serve a zone in which mass-wasting is especially vigorous. Only the central and largest branch has been able to approach the alpine zone closely.



Will F. Thompson

Fig. 3. THE AMMONOOSUC RAVINE



Will F. Thompson

Fig. 4 KATAHDIN FROM THE EAST

other nearby is reported to have 200 feet of frost. Both are kept open only by lowering heaters into them.

Felsenmeers creep downslope and converge in cirques abandoned by alpine glaciers. In the accumulated detritus soil-ice builds up into thick masses (rock glaciers) which creep like a small glacier, though far more slowly (Wahrhaftig and Cox, 1959). The best example in the Presidentials is in King Ravine, where hut boys have long gathered ice beneath the vast boulders of the rock glacier in midsummer in order to make ice cream for guests at the Madison Spring Huts.

All the important deficiencies of the Goldthwait theories are due to lack of knowledge of felsenmeer creep and related processes. The Presidential felsenmeer is free of segregated ice masses near its surface, so that its boulder mantle rides along on its creeping, frost-stirred underlayer (congeliturbate zone). Cairns, rock walls, and lichen-covered rocks ride along also, without being much disturbed during any such brief period as a decade or two. Local crowding of the boulders, and the fact that their undersides are as weathered as their tops, indicate that they change position slowly within the moving mass, but their lichens can usually migrate fast enough to keep up. Instances where lichens do not keep up with boulder rotation will be described in later sections of this study.

Lack of moraines below Presidential cirques may be explained by the action of rock glacier movement and felsenmeer creep. Patterns formed by redistribution of moraine material are much more conspicuous on Katahdin than on the Presidentials because of the larger scale of post-continental local glaciation there. There is evidence that in both ranges glacial remnants have persisted in some cirques until fairly recently. The two sections of this study to follow will describe in detail such phenomena and many others as they occur on the two major New England alpine massifs.

Opposite. That Katahdin has been more deeply dissected by alpine glaciers than the Presidentials is probably due to a cooler and moister climate. For the same reason, post-continental alpine glaciers have left more definite evidence of their presence than similar glaciers on the Presidentials. The Knife Edge (the arete which connects the foreground peak, Pamola, with the main mass of the mountain) is much too sharp and fragile to have undergone continental glaciation in its present form. Thus we know that the great cirque of which it forms the rim (South Basin, between Pamola and the main summit) has been substantially enlarged by an alpine glacier since continental deglaciation.

Note that moderated alpine slopes are continuous beyond the summit cone from Hunt Spur (left) to the right margin of the picture. They actually extend much farther to the right, running the full length of the range. The profile of the Knife Edge suggests that lawn slopes may once have surrounded the summit cone.

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THE ASCENT OF MASHERBRUM

by GEORGE I. BELL

MASHERBRUM, AT 25,660 FEET, is one of the outstanding peaks of the Karakoram. On the north and west it soars 13,000 feet from the Baltoro Glacier in an impossible series of rock cliffs and hanging glaciers. On the south and east it is slightly less precipitous, but rises three vertical miles above the Hushe valley in an impressive enough fashion to be known as "Doomsday Peak" to the natives.

It is only natural that mountaineers should have been attracted to Masherbrum for many years. The first attempt was made in 1938 by a strong British team. They approached from the south via the Hushe valley and found a complicated route through the lower defenses of the mountain. Eventually two members of the party established a high camp at perhaps 24,600 feet on the steep southeast face. There they were afflicted by storm, avalanche and exposure, and managed to escape only with severe frostbite.¹ This expedition, however, discovered the route up most of the mountain which has been followed by all subsequent parties. In 1955 a New Zealand expedition made an attempt somewhat too early in the season and was prevented by deep snow from reaching the 1938 high point. Finally, in 1957, a group of determined and skilful climbers from Manchester, England, was at work on the mountain for a period of nine weeks. They made two attempts to reach the summit ridge, on the first being turned back by poor snow conditions in a steep gully, while on the second two brilliant rock climbers were stopped within 500 feet of the summit by technical difficulties on a rib beside the gully.²

Thus, when in November, 1959, Nick Clinch received permission from the government of Pakistan to organize and conduct a joint American-Pakistan expedition to Masherbrum, he recognized this as a great challenge and opportunity. He had already persuaded me to serve as leader while the expedition was in the field, and we at once set out to obtain as able and congenial a group of American climbers as possible. Selection of three Pakistani climbers was to be made by the Pakistan Army Sports Control Committee, subject to our approval. The other Ameri-

GEORGE I. BELL, a Corresponding Member of the Club, now engaged in research at Los Alamos, N. M., is one of America's foremost mountaineers. Among other achievements he took part in the expeditions to Yerupaja and Salcantay in the Peruvian Andes, and in the 1953 expedition to K2.

¹ Kenneth Mason, *Abode of Snow* (London, 1955), pp. 253-256.

² *Alpine Journal*, Nov., 1958, pp. 169 ff.

can members of the expedition were: Richard Emerson, sociology professor from Cincinnati, Ohio, who had been for many years a climbing ranger in the Tetons, and at 35 was our oldest member and one of the strongest as well. Dr. Thomas Hornbein from St. Louis was our medical man. In addition to having the usual qualifications, Tom was a specialist in high-altitude physiology and difficult rock problems. Tom McCormack (Mac), rancher from Rio Vista, California, had already proved his ability at high altitude on Hidden Peak in 1958. The party was rounded out by two who had been professional guides for several summers, namely: Dick McGowan, who had been head guide on Mt. Rainier for four years and had been a member of the International Himalaya Expedition to Lhotse in 1955; and last but far from least William Unsoeld, who is well known as a senior Teton guide and had been a tower of strength on the California Himalaya Expedition to Makalu in 1954. Dick is a geography teacher in Seattle and Willi a professor of comparative religion at Oregon State College.

We had expected that among the three Pakistani climbers would be Captains Akram and Rizvi, who had proved themselves on the 1958 American expedition to Hidden Peak. Indeed, it was because of his good experience with these two Pakistanis on Hidden Peak that Nick had determined to make ours a joint American-Pakistan expedition. Unfortunately, Captain Akram had died of pneumonia in the interim and Captain Rizvi, who had been on Masherbrum before, was not available. However, the Pakistan Army Sports Control Committee did select three excellent men for us, Captains Imtiaz Azim, Akram Qureshi and Jawed Khan. All had some climbing experience and spoke excellent English. Jawed had scaled a 24,000-foot peak the preceding summer with a British-Pakistan expedition, and although not so rugged in appearance as his two compatriots, he soon demonstrated great drive and endurance.

As our party began to firm up we obtained the sponsorship of the American Alpine Club (all the Americans were members of the A.A.C.). The Sports Control Committee was a joint sponsor, and in addition we secured great assistance from the Swiss Foundation for Alpine Research and also from the Explorers Club.

Throughout the winter we accumulated the necessary supplies. Most came from the United States, including Cunningham tents, Bauer down equipment, and Plymouth ropes. Butane stoves came from France, oxygen apparatus from France and Switzerland, and food from Switzerland. Nick had his experiences of organizing the Hidden Peak trip fresh in mind and thus knew good sources for all important items of equipment. We arranged for six of the best Balti high-altitude porters; all had served with distinction on several previous expeditions, and we found that we could rely

on each man for day after day of heavy carrying. They were Ghulam Rasul, sirdar, and Kassim, Abdul Rahim, Rahim Khan, Mohammed Hussein, and Hussein. I was particularly delighted that we should have Mohammed Hussein, for he was the strong man who had carried me much of the way out from K2 in 1953. They were a magnificent group as porters and as men.

Finally all preparations were complete and on May 12 we rendezvoused in Karachi. There followed the usual frustrations of dealing with innumerable customs officials, straightening out faulty shipping invoices, then accompanying the baggage by train to Rawalpindi and waiting out the heat until we could fly to Skardu. The flight past Nanga Parbat to Skardu was even more impressive than I had remembered, but Skardu itself was a bit disappointing. When Houston's K2 expedition arrived in 1953, as the first post-war expedition in the area, we were met by the entire town with flags waving and bands playing. By now the town had seen so many expeditions that the children playing beside the street scarcely turned to watch us pass. In Skardu we learned that coolie wages had roughly doubled in two years but, boldly plunging further into debt, we pressed on to base camp.

Masherbrum can be reached quite easily from Skardu. The trail distance to base camp is only about 105 miles and 60 of these (up the Indus and Shyok rivers to the beautiful town of Khapalu) can be covered by jeep. We chose to "get in shape", ignore the jeep, and even carry packs. We had been warned about the difficulties of the first day's march, 18 brutally hot miles to Gol, but vowing to make the coolies earn their pay we pushed them on to an even worse second day, 20 scorching miles to Gawali. Actually the coolies reached Gawali in much better shape than most Sahibs. On the fourth day we reached Khapalu and there enjoyed a day of rest, while the coolies were being ferried across the Shyok river by goatskin raft, by visiting the local high school with Polaroid camera and dining with the Rajah of Khapalu. At one point the Rajah cast a solemn air over the festivities by informing us that the Sanskrit meaning of "Masherbrum" is "Day of Judgment or Doomsday Peak".

In two pleasant days up the beautiful Hushe valley we reached the last village, namely Hushe, which means "happiness". Finally, on May 30 we covered the last stage to base camp, a climb of some 4000 feet up the East Masherbrum Glacier to its junction with the Serac Glacier at about 13,500 feet.

From this point the ascent of Masherbrum is like climbing two peaks. One first threads a way through the three icefalls of the Serac Glacier and up the flanks of Serac Peak to the summit of the Dome at about 21,000 feet.³ This is the first peak. From the

³ See the sketch in Mason, *op. cit.*, p. 254, and *Alpine Journal*, Nov., 1958, p. 172.

Dome a plateau leads to the base of the final steep southeast face. Our plan was first to establish a strong advance base camp on the Dome and, taking advantage of a prolonged period of fair weather, we set about this task as rapidly as possible.

Advance parties, spearheaded by McGowan and Unsoeld, swiftly found routes through the rather difficult and broken icefalls. We hired some local Hushe porters for heavy carrying on lower parts of the route and they performed splendidly as long as the weather held fair. The first icefall was climbed straight through the center; the second was flanked by a snow gully which had been aptly christened "Scaly Alley" in 1938. Camp II was located atop the second icefall at about 16,000 feet. It was established on June 2 with Unsoeld and McCormack in residence. In the third icefall we used aluminum ladders to reinforce two of the most doubtful snowbridges over bottomless crevasses. Above, the route traversed a small plateau which was menaced from above by gigantic ice cliffs near the summit of Serac Peak, and then ascended the slopes of the Dome for a few hundred feet to Camp II at about 19,500. This camp was clear of the ice cliffs but we were never completely certain that the snow slopes above it might not slide under appropriate conditions. Initially, a few snowflakes would perturb the sleep of those at II, but as snow accumulated and nothing slid we became able to ignore the hazard, if any. The route ascended the snow slopes directly above II and passed under a small cornice on rather steep slopes, where we fixed 300 feet of rope, to reach the top of the Dome and Camp III.

First loads were carried to Advance Base Camp (III) at 21,000 on June 9 in partly cloudy weather. At the time we were grateful to the clouds for shading us; for the previous ten days we had been forced to make very early starts to escape the intense heat of the sun. Little did we realize that the next day would be the first of twenty-four consecutive days on which snow would fall. The good weather was at an end. Fortunately, we were well equipped with 600 willow wands for marking the track. Without these our progress would have been halted or at least made quite hazardous.

On June 12 a route was found across the plateau and through a small icefall to Camp IV at 21,000. But heavy snow fell that day and the following ones as well. I knew that without fair weather above Camp V there was no hope of success and at night, at Advance Base, I worried about the safety of the slopes above Camp II and wondered whether, as on K2 in 1953, we were to be defeated by a summer of continuous snow and storm. I note this melodramatic entry in my diary at Advance Base: "In all Himalayan mountaineering one is called upon to acknowledge the infinite superiority of powers far above the simple humans who hopefully ply their trade upon the mountain. The storms

that finished Claude Kogan, Willy Merkl, and the efforts of countless others *can* finish us on Doomsday Peak, or the fair weather that shone upon Evans on Kangchenjunga and on Franco on Makalu can give us success. No one has ever *conquered* a major Himalayan peak. Some have been favored with fair weather and luck, and with good preparations and good climbers they have gained a summit; but there has never been an expedition so well equipped that it did not require luck and good weather at crucial times."

By June 20 Advanced Base was stocked with three weeks of supplies, Camp IV was well stocked, and we were prepared to move to Camp V and above. Camp V was located at about 23,000 feet, just above a saddle at the north end of Masherbrum's south-east face. Above this camp the face rose steeply to the summit, but broken about halfway up by a band of ice and rock cliffs. The only place where the band of cliffs could be crossed was at the southern end of the face; indeed, we judged from photographs that the ice cliffs extended farther south than they did in previous years. At any rate, above Camp V it would be necessary to traverse most of the face before one could pass the cliffs. We had originally planned to place two camps above V, but the unsettled weather led us to hope that with a liberal use of oxygen and fixed rope we might be able to make the summit from a Camp VI.

Accordingly, on June 22 Unsoeld, McGowan, Clinch and four porters broke a trail through knee-deep snow diagonally upward across the face. They placed 200 feet of fixed rope past one steep section and finally, after a very hard day, found a more or less protected site for Camp VI at about 24,000. The camp was partly under a serac and partly in a crevasse of undetermined depth. Unsoeld and McGowan remained in camp to prepare the route above. On the following day Hornbein and I joined them and Nick and the porters relayed another load to VI. Meanwhile Unsoeld and McGowan had climbed 500 feet above camp and returned reporting that it was very steep up there. They advised that all possible fixed rope be installed, and on the next day Tom and I removed all fixed rope from the route below Camp VI for possible use above.

On June 25 Unsoeld and McGowan awoke at 1 a.m. and left camp at 2.45 with high hopes for the summit. They were using oxygen but were having to break trail all over again after our usual afternoon snowfalls. At about 5 a.m. Tom and I left camp carrying fixed rope, iron and extra oxygen to facilitate the descent. We soon saw that Willi and Dick were finding slow going above. However, they had passed the lower end of the great ice cliff and were now traversing above the ice cliff. In fact, they were on thin snow over ice and looking for better snow conditions.

At this point Willi introduced Dick to a new type of belaying technique seldom used on Mt. Rainier. It was called the "patted shaft belay". After carefully observing the technique, Dick voiced his opinion of psychological belays and placed an ice screw. After two rope-lengths they reached better snow and moved upward toward the bergschrund. Around noon they reached the schrund and sat down for a well-earned lunch. Snow began to fall and the wind to blow. By this time Tom and I, having completed the "patted shaft" traverse, were running out of fixed rope and enthusiasm. As we started down we heard Willi's cheerful call from out of the storm above, "See you on top". We reached camp without difficulty, thanks to the thousand feet of fixed rope in place. Willi and Dick followed the schrund somewhat farther, but as the storm grew worse they also retreated. Small slides of fresh snow were now crossing the route from time to time. One small avalanche swept Dick off his feet, but fortunately Willi was firmly anchored and held him. At 5 p.m. they regained Camp VI, tired but safe.

From this attempt we concluded that a higher camp, VII, was absolutely necessary. The bergschrund appeared to be the only possible location and Willi and Dick had left a cache of hardware, willow wands and rappel rope at a likely site in the schrund. For another thing, it appeared that oxygen was of little use and we determined to leave it behind at the next attempt. For the moment we enjoyed a day of rest before establishing Camp VII.

But the 27th dawned in threatening fashion, a major storm appeared to be moving in. We decided that a temporary retreat was in order. However, we were loath to put this decision into effect and consequently it was 11.30 before we left camp in a howling blizzard. Thanks to the numerous willow wands in place we were making good time down the steep face—until of a sudden no more wands were visible ahead! We groped slowly forward, looking for a next wand. I felt something moving by my feet and then it hit us—a powder snow avalanche! I remember driving my ice-axe into the slope and holding on. Then, as the snow rose over my head, I was swept away and as I tumbled head over heels I tried to brush snow from my face to get some air. As the avalanche slowed I tried to make a self-arrest with the ice-axe shaft. We stopped. I was upside down and could see nothing. Gradually I righted myself. Willi was shouting, calling names to make sure that no one was buried. We all replied. I cleared the snow from my goggles and glasses and began to see something. Indeed, the snowfall seemed to be providentially stopping. Below me McGowan was stumbling about in some distress. He threw off his pack and it started tumbling down the slope; Hornbein below barely managed to intercept it. Willi was

hurrying down to help Dick. We leveled a small shelf in the snow and persuaded Dick to lie down for a moment. We didn't know how far we had fallen but it was apparent that we were still in an avalanche track and should move at once.

Fortunately, it continued clearing and we soon saw where we were. We had been carried 200-400 feet down the slope and had stopped maybe 100 feet above a good-sized ice cliff. By a horizontal traverse we could regain the route into Camp V. We yelled down to Camp V and helped Dick to the edge of the avalanche track. He told us that he had breathed considerable snow from the avalanche because the climbing rope had pinned his arms to his sides. Soon Dick was able to stumble down to Camp V without support and in a few days he was fairly fit again.

I find it interesting to reflect that during this avalanche I had no particular feeling of fear or apprehension. There was much to be done and I was busy doing it. On the other hand, during my fall on K2 in 1953 there seemed to be nothing to do and I was convinced of the imminence of death.

The avalanche redoubled our conviction that fair weather was absolutely necessary for activity above Camp V. But snow followed snow, and avalanches roared down the face like express trains. There was some shuttling of people and supplies between III and V, and porters were sent down from III to bring up more butane from Base Camp. Finally, the weather cleared on July 4 and Willi, Dick Emerson, Jawed and I reoccupied Camp VI that day. The tents were completely buried and required considerable excavation. On the 5th we established Camp VII in the bergschrund at nearly 25,000 feet, and Willi and I remained there to attempt the summit. Unfortunately, we were unable to find the cache which had been left before. In it we lost all the high rock pitons, bolts and willow wands, and many of our ice pitons and screws, rappel pickets and rappel rope.

We left camp at 5 a.m. on July 6 and followed the bergschrund for about an hour. Here we were directly under the snow gully which leads to the summit ridge midway between the twin summits of Masherbrum. This gully was our proposed route and we crossed the schrund and climbed two rope-lengths to reach the gully. Its lower end was nearly crossed by a vertical band of rock. Near this the snow was soft and the going difficult. Above, the gully was composed of steep ice on its right side, fluffy snow on the left. Between the ice and the fluff Willi found the snow sufficiently good to permit progress; kicked steps were often insubstantial, but the ice-axe shaft held beautifully. On rocks to the left we saw a rappel line left by Whillans and Walmsley in 1957. Overhead the sun beat down upon us mercilessly; it was by far the most painful affliction of the day. No air stirred in the gully.

Finally, at 11 a.m. we escaped our reflector oven and reached a chill breeze on the summit ridge.

At the point where we reached it, the ridge was a true knife-edge, falling away at perhaps 50° down the gully and 65° on the other or Baltoro side. Turning toward the north and higher summit, we were immediately confronted by a rocky gendarme. Willi turned this on the west or Baltoro side. He drove an ice screw into a rock crack for protection, balanced across on loose rocks frozen in the ice, and used a falling-traverse technique. The rock was here friable and unpleasant. Above the gendarme we followed a snow knife-edge again for about 200 feet to the base of a vertical rock step about 40 feet high. Here the rock was good and a short but strenuous chimney took us up to a halfway ledge. In this sheltered spot we ate some lunch while our comrades, watching from far below, wondered whether we were stuck at this apparently difficult spot. Lunch over, we climbed small ledges to the top of the step.

A gentle snow ridge lay ahead. For the first time we glimpsed the majestic cone of K2. We followed the ridge for 250 feet more and then there was no place higher to go! We were on top. The view was clear and stupendous. At our feet lay, on the one side, the slopes up which we had toiled, with the tents of Camp V nearly 3000 feet below looking within reach of a stone's throw; while, on the other side, lay the immensity of the Baltoro Glacier. The peaks of the lower Baltoro—Paiju, the Trango Towers, the Muztagh Tower—were dwarfed beneath us, while to the north rose the 8000ers of the Baltoro—Hidden Peak, Gasherbrum II, Broad Peak and above all K2. It was a sublime view. We reached the summit at 3.15 and stayed there an hour.

We climbed and rappelled down the rock step, rappelled from the gendarme into the snow gully, and then from aluminum pickets driven into the snow we rappelled down the gully. We returned to Camp VII at 8 p.m., dead tired and I with a very bad cough which Willi treated with antibiotics and other heroic measures.

On the next day Willi and I sluggishly climbed down to Camp VI, while Nick, Dick Emerson and Jawed climbed up to replace us at VII for another ascent. Theirs was a somewhat more eventful climb than ours. First of all, while they were trying to light the bivouac stoves for a very early start, a fire broke out in the tent. It consumed the inner lining of the tent before being smothered by down clothing, thrashing bodies and the like. This blaze discouraged the early start and it was not until 7.30 that anyone was ready to leave. Dick Emerson decided to stay in camp, partly because he was not feeling strong and partly because he knew that a rope of three could not possibly make the summit without being benighted. Nick led the climb with

oxygen, while Jawed followed steadily over climbing more difficult than he had ever done before. They reached the summit ridge at 2 p.m. and, as the weather showed every sign of remaining mild, they pressed on to reach the summit at 6.30. A full moon was rising as they rappelled into the snow gully. As they were pulling the rappel rope down, it became caught in the rocks, and Nick was forced to cut it. The climbing rope was then too short to enable them to rappel from one picket which we had left to the next. Indeed, most of the night was spent descending 120 feet to the lower picket where we had left our rappel rope. During this night Jawed's feet became slightly frostbitten, he also lost a down mitten, and gained a frostbitten hand, but he never lost his nerve. At 7 a.m. they finally returned to Camp VII, quite exhausted.

However, their troubles were not yet over. Food was short at VII and the weather was threatening to deteriorate again. Thus, without a night's rest at VII they descended to Camp VI, arriving at 9.30 p.m. On the following day, the 10th, Willi and Tom climbed from Camp V to Camp VI to help with the descent. They reached VI just as a storm began, relieved Nick and Jawed of their packs, and guided them down through the gathering storm. All had reached V before serious avalanches began to sweep the face. By July 12 we were all safe in Base Camp. There, inspection showed that Jawed's frostbite was unlikely to result in permanent injury.

It should be mentioned that during the period of summit activity Mac had been left at Advance Base Camp to oversee a build-up of supplies from Base Camp which was to recommence in case the weather failed us. On July 9, after news of the two summit parties had reached him via the porters' fantastically sharp eyes, he and Abdul Rahim made the first ascent of Serac Peak (about 22,000 ft.). It was readily reached from Camp III but involved some steep and exposed snow climbing at the top.

As readers of this journal realize, any attempt on a Himalayan or Karakoram giant, such as Masherbrum, is a siege laid by a team and their success, if any, is due to the good work of every member of the team. We had such a team and my only regret is that every climber could not have reached the summit, so that the cooperative spirit of the ascent would be as evident to everyone as it was to us.



THE MASHERBRUM GROUP FROM THE BALTORO SIDE



CHARLIE'S BUNION IN THE GREAT SMOKIES

Edward N. Little

GEORGIA TO MAINE, MARCH TO NOVEMBER

by MURRAY S. CHISM and EDWARD N. LITTLE

FOR MANY YEARS we had dreamed about walking the entire Appalachian Trail, but we were forced to wait for retirement days to obtain our chance. That retirement gave one of us sufficient time, while a generous leave of absence from semi-retirement work made the trip possible for the other. Fortunately, at the time both of us were in very good physical condition.

One thing is certain: we had not set our goal years ago and then stuck to it through thick and thin. For long periods it was merely a smoldering idea. On occasion it would burst into flame for discussion, when in recent years we took one-day walks almost weekly or made backpacking trips of three to five days in our vacations. Some of these longer trips were over sections of the AT—in the Smokies, the Blue Ridge, the White Mountains and around Katahdin—and their beauty and variety appealed to us greatly.

On these trips we learned how important conditioning and adequate preparation really are. Wrong footwear is hard on tender feet, and the shoulderstraps of a too-heavy pack can cut mercilessly into soft muscles. Type of food and calories per ounce can be important enough on a several days' outing to show how necessary it would be to consider this on an eight-month backpacking trip. Thus we tried this and that, and discarded what proved unsuitable. Probably our final choices would differ widely from those of others experimenting as we did. (See notes at end.)

There were some basic decisions to make. After many discussions pro and con we decided to make the trip from south to north. We could get an earlier start that way, and we thought we might be able to get through much of the hottest part of the trip before summer drought dried up too many of the sources of water supply. We might be able to keep ahead of the worst of the summer growth in the southern states, instead of heading into it after it had reached its peak. We might keep ahead of the worst of the insects, especially chiggers and ticks. With the early start we should miss many of the poisonous snakes in the southern part.

In retrospect some of these ideas were good, others not so good. Due to the cold weather we did miss the poisonous snakes until we got up into Tennessee and Virginia. However, we then

MURRAY S. CHISM, 66, of Tenafly, N. J., and EDWARD N. LITTLE, 67, of nearby Englewood, both members of the Club, have been close friends since their days in the Class of 1916 at Yale. Before retirement, Chism was associated with the General Foods Corp. in New York and Little was an engineer with the A.T. & T. Co., also in New York.

killed three rattlers and one copperhead, each lying just a step or two ahead of us on the trail when we saw it. There was always a bit of wonderment in our minds as to how close we may have come to others as we walked through that waist-high and shoulder-high summer growth, unable to see our footway. The summer growth was a nuisance in other respects. It scattered a heavy load of pollen, to irritate noses and throats, and some of the weeds were nettles which stung hands and arms for a time.

Black flies and no-see-ums were at their height, to follow us northward much too long. All things considered, however, we still favor the south-to-north direction under normal weather conditions. Under normal ones, yes; but how should we have fared in 1960, with the unusually heavy snows late in the season in the southern mountains?

We decided to make the trip a backpacking expedition and to carry in our packs everything we needed to sustain ourselves on the trail from the time we started one "hitch" in our journey until we made contact again with our supplies. We planned to use lean-to shelters along the trail wherever they were available, but we would carry light, nylon, one-man tents for use where there were no shelters or when shelters were already occupied.

We knew we were in for a lot of hard physical effort and a long steady grind, but we made up our minds that we would enjoy the trail and the experience to the utmost. We were not out to set any records for speed or endurance, and we wanted to be in better physical condition when we finished than we were at the start. We agreed that if the trip ever began to get us down, it was time to stop. There were rough days, of course, but things never quite came to the point of getting us down although, because of weather, the last couple of weeks in Maine were rugged enough. By that time, however, we were so close to our goal we could not quit!

Our biggest problem was to figure out how to replenish our food supplies, provide clean clothes, and replace or repair equipment which might fail or wear out. We thought of depending on the towns we passed through, or near, for the common items and mailing to ourselves the special things we might need. But maps showed that the trail actually passed through towns at only infrequent intervals. The better part of a day might be lost getting to a nearby town or even store. Long stretches of trail ran through wilderness areas with no towns around and, as we learned, no houses in sight.

The maps also showed, however, that the trail crossed highways or roads passable by automobiles at fairly frequent intervals. If we could only arrange to have a car at such crossings! Luckily for us, Mrs. Little was enthusiastic about the idea of

chauffeur the family car as a supply car (she later dubbed it the "chuck wagon"). Our biggest problem was solved.

With a car available we could order all the special dehydrated foods required for the whole trip and carry them along until needed. Mrs. Little could double as shopper for the items that could be obtained in local stores. We could also take along clothing for different seasons, and replacements while laundry was being done. Spare equipment which we thought we might need and repair kits also could be carried. As it worked out the car fairly bulged.

The car could serve still another purpose. It could take us off the trail at least once a week. That would mean a hot shower and a day for repacking food, checking equipment, and even the chance to care for items of personal business. It would mean an opportunity to clean out the carbon which clogs the gas passages of the Svea gasoline stove we were to use for all our cooking (a very necessary precaution to insure a reliable stove at all times). Looking back, we agree with what we have been told, that such a weekly let-up in the daily walking grind actually improves efficiency. You will have to take our word for it that we lived up to our determination to be put back on the trail on the very same spot from which we had been picked up.

When, in the summer of 1958, we decided to make the trip in 1959, most of our spare time from then on was spent in preparation. One precaution was to try to avoid the confusion which can arise in planning a meeting at a spot which neither the car-driver nor the walker has ever seen. Therefore we scouted by auto nearly all the places where the trail crosses an automobile road, clear from Maine to Georgia. If later we decided to use a crossing we had missed, we could scout it on our day off.

As a result, all but three of our meetings went off like clock-work. We were a day late for our very first meeting, due to weather and obscure trail conditions between Mt. Oglethorpe and Springer Mountain. On the appointed day, as we had previously agreed, Mrs. Little did not wait after four o'clock, but returned the next morning; and soon we came down the trail. A near-miss was once avoided by an observant truck-driver. As he hauled his loads of sand past our roosts by the side of the road he noticed us and our packs. Then, about a mile and a half up the road, he passed Mrs. Little waiting in the car, also by the side of the road. He put two and two together and the next time he passed us he asked if we could be waiting for a car with a New Jersey license to pick us up. The fortunate result: Mrs. Little was told where we were and soon appeared. Another time we fortunately had scouted the crossing just the day before and knew exactly where the car should be. But we had been told

the wrong name for the road. When we crossed the road which the guidebook showed to have that name, no car was to be found. After some serious cogitation we skipped lunch and walked another three and a half miles through a drizzly rain to a successful meeting at the next road crossing.

Before we started we had our doctors check us over and they said we were O.K. We had shots for typhoid, tetanus and Rocky Mountain spotted fever (ticks, you know, up as far as New Jersey). We added a vitamin-mineral-protein supplement to our cocoa mix and planned to take a vitamin capsule every other day. Enteric-coated salt tablets were taken along to make up for body salts lost through perspiration. Later we decided that taking one each day, even in the cold weather, checked dehydration and prevented muscle cramps.

There is something especially healthful about walking and living in the open. Frequently our feet were wet for days at a time, especially in Maine. Wet or dry, often they got pretty cold while we stood around preparing and eating supper and breakfast. Yet neither of us had to stay off the trail for a day on account of illness. One slight stomach upset apiece (at different times), a couple of days with scratchy throats, and a tooth which had to be extracted because of a serious root infection were the extent of our ailments.

All our preparations took what seemed like an endless amount of time. We had camping and fire permits to get, and maps and mimeograph sheets to supplement guidebooks where there were relocations. We could have used even more time, but cut it short and made our start from Mt. Oglethorpe, Georgia, on March 10, 1959.

Our first-aid kit was a marvel of completeness. However, there was no need to open it up except for half a dozen bandaids for cut fingers and some slightly red spots on heels or toes, for two aspirins, some salve for a scratched eyeball, and salve for a wasp sting. We lost weight—25 and 20 pounds, respectively—some of which was regained later in the trip. Apparently it was unnecessary padding, though neither of us was overweight. We felt fine and found we could stand more exertion the farther we went.

The early spring cold in the mountains of Georgia, North Carolina and Tennessee made us wish we had started at least three weeks later. We had some light snow there. In April we had a four-inch snowfall in the Smokies, following a couple days of drenching rain. In Virginia we ran into three weeks or so of some of the hottest weather they had had in years. Our nearly five weeks in Maine gave us an abnormal total rainfall, which meant bad going, and it was very cold at times. There was snow there, too, but fortunately it was not heavy enough to block



Alice D. Little

STARTING FROM MOUNT OGLETHORPE, GEORGIA

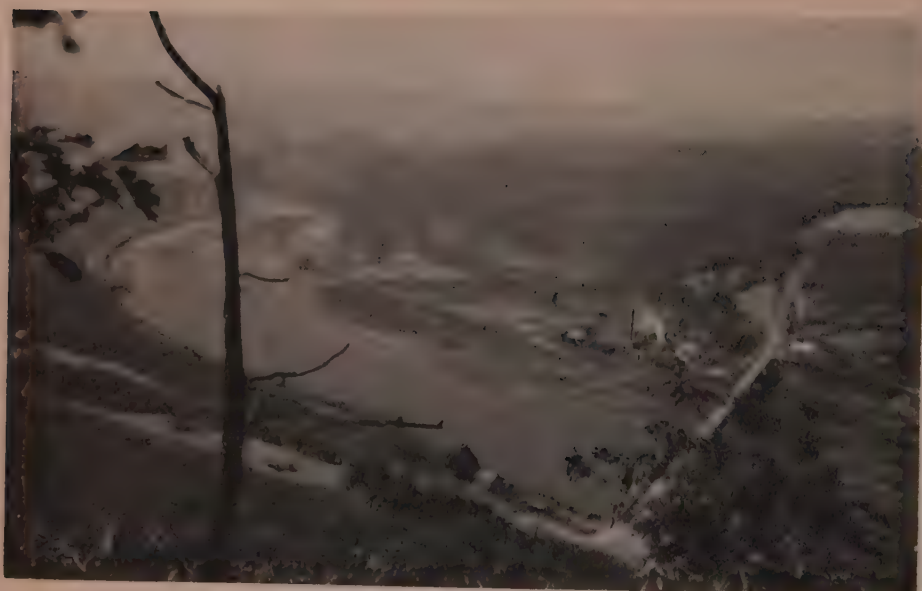
Murray Chism and Edward Little



Edward N. Little

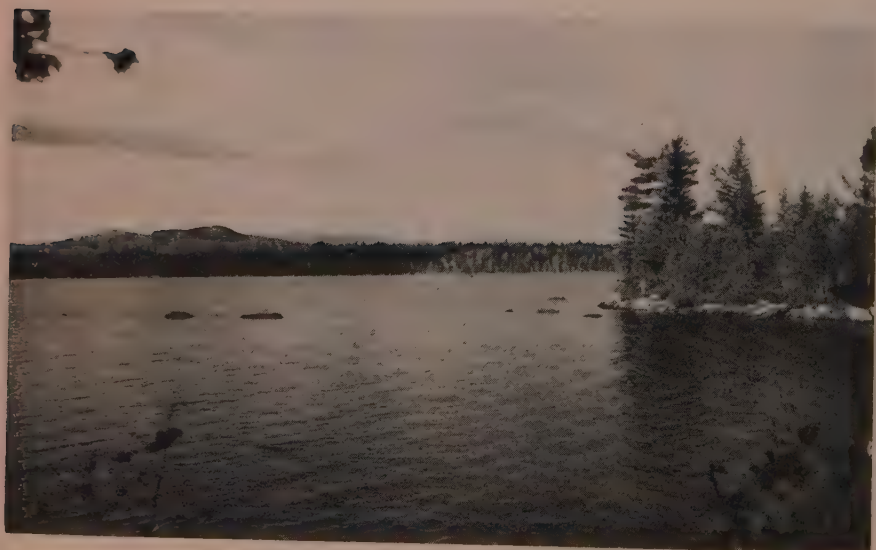
ICE-WATER SPRING SHELTER, GREAT SMOKIES

April 14, 1959



Edward N. Little

LEHIGH RIVER AND HIGHWAY BRIDGE



Edward N. Little

MOUNT BIGELOW ACROSS EAST CARRY POND

further walking. The final ascent of Katahdin, on November 8, was in a light snowstorm. The boulders and many trail paint-marks above timberline were glazed with half an inch of ice and covered with an inch of snow. The cylinder at the summit was so encased with ice that we did not take time to open it and register. However, taken all in all, the weather probably should not be considered to have been abnormal.

We had backpacked our way something over 2000 miles (with relocations, detours and the like no one knows exactly how much more). While we were doing this Mrs. Little had driven the family car 14,000 miles and had had a wonderful experience on her part.

No doubt the New England part of the trail is more familiar to most of our readers than the sections farther south. We were amazed to find the trail through Georgia, North Carolina and Tennessee so very rugged. The mountains rise so steeply from the deep gaps between them that footing on the dry oak-leaf carpet of the trail was often very slippery. In the Smokies, especially, the slopes of the mountains are deeply scored, with sharp fins between the low, sloping ravines. All about, in these parts, the mountains lie in a wild jumble. But not all are of this character; there are many balds. Practically devoid of trees, these rounded domes are interspersed among the more rugged peaks. The balds and many lookout points on the high-timberline peaks afford grand scenic vistas.

In Virginia there are broader valleys between the mountains, which gradually diminish in height until the last of the 4000-footers is passed, Hawksbill Mountain in the Shenandoah National Park. In fact, the trail does not again traverse a 4000-foot peak until Killington is reached, in Vermont. In Maryland, Pennsylvania and New Jersey there is much rocky trail. Especially in Pennsylvania there are so many of these rocks, close together and on end, that it is hard on footwear and feet.

These are by no means adequate descriptions of the trail. We passed through majestic forests, cool and moist even at high noon; through park-like woods, sunny and friendly; through woods with such dense undergrowth that they were almost impassable except along the trail. There were always mountains, either right under our feet or in the distant blue haze. Sometimes they overlooked long, winding river valleys with their endless charm—the Nantahala, the New, the James, the Shenandoah melding with the Potomac, the Juniata and muddy Sherman Creek flowing into the broad Susquehanna, the Lehigh, the Delaware, the familiar Hudson, the placid Housatonic, and the lovely Connecticut.

We stepped where heroes had marched in bygone wars. We

followed paths used by the early pioneers and were humbled by the thought of the hardships they had endured as compared with our slight inconveniences. We labored wearily along jeep roads that had been pushed through incredibly rough terrain to bring quick fire-protection in emergency; along old stage-coach roads; on abandoned railroad rights of way; along canals now clogged with trees and vegetation; through muddy manganese diggings.

We had met dozens of people walking on the trail. Not very many of these were covering more than short distances. Shelter occupation was worst in Shenandoah National Park, where the trail is a mere stone's throw from the Skyline Drive and the shelters appeal to overnight and week-end campers, and in New England, where boys and girls from summer camps are taken on short trips which include overnights at convenient shelters. These boys and girls were a nuisance with their unwillingness to give way to sleep until well after midnight, whereas we wanted nothing more than to get to sleep immediately after supper!

However, the walkers we met on the trail, and the cordial fire towermen we always stopped in to visit were always interesting. We were impressed with the homely wisdom of those on and off the trail whom we met, their sense of humor and friendliness, and the independent spirit of those who live close to the mountains and wrest their livelihood from reluctant nature.

It was an unforgettable experience, and it leaves one with a new appreciation of this land of ours and with the fervent hope that the AT will long remain, unbroken and unspoiled, essentially a wilderness footpath for the enjoyment of walkers.

SUPPLEMENTARY NOTES ON EQUIPMENT, FOOD AND TRAIL CONDITIONS

We carried Kelty packs with full-size bags. We wore Bean's Maine hunting shoes, resoled when necessary, with the wear distributed over several pairs. We estimate that we each wore out six shoe-bottoms: the first pair, at the southern end of the trip, lasted about 500 miles, but the pair worn over the sharp, rocky trail in parts of Pennsylvania, Maryland and New Jersey gave a mere 275 miles. We wore no inner-soles and no heavy padding of socks, and had no foot trouble at any time.

We planned to use wood fires for warmth in cold weather but to do no cooking on them and carry no axe. A Svea stove and white gasoline served for all cooking. Quite unconventionally, we used a Mirro 2½-quart pressure cooker for preparation of our evening stew; we thought its efficiency, and the better-cooked food, more than made up for the disadvantage in weight. Especially, we were able to use the bottom of the cooker, with a covered, shallow cake pan, to bake a bannock or a Betty Crocker muffin. This we did each day, using half the product for supper and the other half for lunch the next day. We could cook it through completely without burning the under side.

Our tents were Holubar's Tiny model, nylon uppers, waterproof

nylon sewed-in ground cloths. (We used an extra ground cloth of U. S. fiberthin, flexible in cold weather and very tough.) As pure nylon cannot be made water-repellent we also used tent-flies homemade from very thin Mylar, adding about 6 oz. to the 20 oz. of the tent. (Such tents are now available with cotton-mixed nylon and so do not require the fly.)

In addition to ponchos we carried waterproof nylon chaps—and if we had to choose between the two might even take the chaps alone! Incidentally, since the trip we have had the ponchos made up for us with the neck-opening about a foot nearer the front than the back, to cover the pack better.

We used Woolite for dishwashing, a very small portion being sufficient and working well in water of any temperature. Our special clothes-washer consisted of a large plastic bag into which clothes, Woolite and water could be put and the end twisted shut. The clothing was then kneaded and sloshed back and forth. But we found it easier to turn our soiled clothes over to Mrs. Little.

Last fall Wigwam came out with a thermal-weave wool sock, which we found very satisfactory during the brief time we had them. We are also enthusiastic about the thermal-weave underwear, half Creslan and half cotton, recently put out by several firms. It kept out cold very well, was not too hot in milder weather, not clammy when wet, and dried quickly on or off the body. For shirts we found knitted Orlon preferable to cotton, wool, or any mixture.

Our diet, based on about 3200 calories per day, was ample and tasty, though without much variety. To add to our daily stew we had Free-dried chopped beef, which is frozen and dehydrated while still raw. It comes in sealed cans, but we found that we could remove it from these and carry it for several days without spoilage in polyethylene freezer-bags. We managed to make powdered egg edible by putting it into the water for the hot cereal, being careful to add the cereal just before the boiling point was reached.

For possessing the longest stretch (300 miles) of shelters at good one-day intervals, Maine takes first place. The only one lacking in 1959 was at Little Wilson campsite. The section least well equipped is that of some 450 miles in southern Virginia, where there are but two lean-tos. The other parts of the trail fall between these two extremes: in some the lean-tos are well spaced for considerable distances, in others there are many gaps, big and little. In a few places (e.g. parts of Pennsylvania) the trail is permitted to use private property only with the specific limitation that no camping or fire-building is allowed—and in many states gasoline stoves fall in the fire category.

Water should not be taken for granted. Even the springs the guide-book calls reliable can be found dry as a bone. It is very wise to have enough water for meeting such conditions in the canteen most of the time.

BACKPACKING ON THE COLORADO

by J. H. BUTCHART

A MEMBER OF THE A.M.C. recently donated a file of old copies of APPALACHIA to the Arizona State College library, and I was particularly interested in two articles. One was "Cockleshell on the Colorado" by A. G. Grant, Jr., in the December, 1941, issue. The other was "Fast Water in the Desert" by Weldon F. Heald in the June, 1946, number. Others who found these articles appealing might like to read a sequel.

Over the years fashions in running the Colorado through the Grand Canyon have changed. The wood cataract boats used by Norman Nevills once had the river to themselves. Each boat carried at most three people. When Nevills took three or four boats through no oftener than once a year, the trip was both exclusive and rather expensive. Mrs. Georgia White now takes parties of thirty, using large rubber rafts, three times in a single summer and charges only a third as much as the trip used to cost. The present de luxe trip is by powerboat. The latest word is turbojets which draw only a few inches of water and can do forty-five miles per hour in still water. In 1960 three of these boats, for the first time in history, made the trip from Lake Mead upstream through the entire Grand Canyon.

At the end of his article, Grant says:

When the *Escalante* slid into Lake Mead, upsetting the dire predictions of the best authorities, it placed the cataract-type of kayak definitely in the top ranks of heavy-water craft. For the first time a light, inexpensive boat had performed a feat formerly considered possible of accomplishment only by cataract rowboats, Salmon River barges, and heavy Goodyear-rubber boats, all costing a small fortune. Using the performance of the *Escalante*, which is now on permanent exhibit on the North Rim, it is possible to design a cheap, seaworthy kayak which, in contrast to all present light boats, can be safely handled by ambitious boatmen on the precipitous waterways of the West.

Grant's confidence in his method does not seem to be generally shared. At least, the feat has been duplicated only once during the intervening years. The fact that Grant took three upsets in one passage and received some support from the rest of the Nevills party in the cataract boats may account for this

JOHN H. BUTCHART is a mathematics professor in Flagstaff, Arizona. He has climbed, skied and canoed extensively in the Southwest, and has discovered lost historic trails, the lost Hopi salt mine, a previously unknown natural bridge in the Grand Canyon and an unknown deer trail down into it from the north rim. But his specialty is travel through the Canyon itself.

view. To validate comparisons, however, attention should be called to the fact that the river was high when Grant made the trip. The seasonal fluctuation of the Colorado is terrific, from a flood stage in early June which varies over the years from 35,000 cubic feet per second up to 126,000. The low water of the late summer and autumn is from 3,500 to 6,000 cubic feet per second. During the low stage more rocks show in the rapids, but the waves are smaller and the whirlpools die out entirely. The white water resembles that of the canoe streams in Maine. In fact, an aluminum canoe has made the traverse of the Grand Canyon. The problem Grant suggested in the quotation above, to run the canyon inexpensively, has been solved by one man who rode the high water of late May sitting in a truck inner tube with a jeep inner tube around his waist. However, he was unable to land at will and missed his destination, Phantom Ranch, entirely. He carried food for five days, and on the eleventh day he was pulled out of the water by the men operating the bat guano mine at the upper end of Lake Mead. Otherwise he might have starved in the slack water. A more successful method was tried by two swimmers who went through in late April of 1955 towing kayak bags containing their duffel. They were met according to schedule at the upper end of Lake Mead by a boat. They even swam the rapids and took movies of each other doing it. This system was used again during the summer of 1960, but the swimmers were stopped by park officials at Phantom Ranch. The park regulations forbid unauthorized trips down the river through the park. Rescue operations, or searches for the body, are both expensive and dangerous.

My system for seeing the wild canyons of the Colorado in safety and comfort is suggested by the title of this article. I carry my supplies in a waterproof rucksack and paddle downstream prone on an air mattress. At low water there are boulder-bars beside all the rapids except Sockdolager and Grapevine in the Granite Gorge just above Phantom Ranch. When I come to any rough water where I might scrape a rock, I land and carry the mattress around the rapid. The loss in excitement is justified by the seriousness of even a minor abrasion which might become infected. There are only a few escape routes from the river and the man who takes one will have a rough time carrying enough water across thirty-odd miles of dry plateau before he reaches the nearest highway. When I am out away from all help for several days, I take a spare mattress. Not only would it get me back to civilization if something should happen to the first, but I have found that it is necessary to combat the cold of the early morning and late afternoon.

Those who have walked in the bottom of the Grand Canyon

during the summer will find it hard to believe that cold can become a problem. If you are half in the water, the evaporation caused by a slight breeze will soon have your teeth chattering. My solution is to pile one mattress on top of the other. This keeps me almost dry. Readers of Heald's article will wonder about the rains. These can come almost daily, and again you can go for a week or ten days with none at all. You can often sit out a rain under an overhanging ledge. If the rain lasted too long, I could walk the talus beside the river wearing a plastic rain jacket. I also wear this plastic jacket in the river, to prevent chafing of the arms as I paddle over the sides of the mattress.

The idea of using an air mattress for transportation occurred to me after a friend described float trips on the Rogue River using inner tubes. I experimented and found that one can propel an air mattress as fast as one can swim the crawl. Then I could go down one trail to the Colorado and come up another with water transportation between. Before I learned that the park officials refuse permission for this sort of thing, a companion and I went from Hance Rapids to Phantom Ranch in about six hours. When we came to the rapids that cannot be bypassed, we would switch the mattresses under our midribs like giant waterwings and ride through any waves at all. We felt safer in the deep breakers of the Inner Gorge than we felt when we were walking over the polished granite in our wet sneakers.

By the summer of 1956 I had heard enough about the scenic boat trip down the San Juan to want to try it myself. The lowest professional rate for the ride was \$100; I also wanted the thrill of being my own skipper and I wanted to demonstrate the feasibility of my system. No one seemed to care to share the experience, so I did it solo. The scenery was the same that Heald described so graphically, but the navigation was quite different from that of Nevills. I carried a rough list of side-canyons, but I lost track and was not sure of any identifications between the Goosenecks and Piute Farms, where the river comes out of the narrow canyon and breaks into many shallow channels. Here I simply deflated the mattress and carried it along a road until the river was ready to plunge into another narrow canyon.

While I was eating breakfast the second day, I heard a shower of rocks and looked up in time to see a bighorn ewe going up the cliff where I had not noticed even a game trail. On the third day, at Piute Farms, a touch of civilization returned. I saw some horses and an Indian couple across the plain. They wondered about the strange ways of some whites, and I wondered whether they could speak English. By this time I was sure that rations for ten days would get me to Lee's Ferry, but the isolation was becoming a bit of a strain. I had an impulse to leave the river and

ask the Navahos kindly to take me to their leader. I let the chance pass, however, and they just watched me disappear around the next bend. That evening, at Copper Canyon, I had a visitor, a friendly little burro. After I had taken his picture, I had to shoo him away from my food with a switch.

All fast-water articles should include a discussion of the strategy of running the rapids. There was no excitement to my system. I simply got out of the water and walked. It was late August, after the last boat party had gone down the San Juan. About every half-hour I would find myself stranded on the sand and would have to pick up the mattress and carry it to a better channel. By this time no side-streams were flowing into the San Juan, and I remember only one place where a seep on the wall made a festoon of maidenhair fern and columbine. I knew when I was rounding the great bend, and when the river was straightening I had my first fine view of Navaho Mountain, the solitary laccolith rising 7000 feet above the river and more than 10,400 feet above the sea. Its crown of pines and aspens seemed to belong to another world. A guessing game I played every time I approached a side-canyon at a bend in the river was to see how soon I could tell which was the main river and which was the dry wash. On the fourth afternoon I had a real puzzler: both openings ahead seemed equally wide and deep. Rather shortly the answer was clear. I had reached the Colorado. That evening I camped near Hidden Passage.

As I walked up this famous glen among the ferns and flowers, I enjoyed the luxury of the first clean bath of the trip. The next morning I crossed the river and followed a trail through the willows back to Powell's Music Temple. Here one can still see the names of some of Powell's men. It seems a shame that the resonant acoustics of this beautiful chamber will be stilled forever by the rising waters of the lake named for the man who loved this spot. I passed by Mystery and Twilight Canyons, but I fully intended to stop and visit Rainbow Bridge for the fourth time. I had been down to the river from the bridge once before, but this time I didn't recognize the mouth of Aztec Creek and passed it also. My last camp was near the mouth of an unidentified glen upstream from the mouth of West Canyon. I had time to explore this for a half-mile or more before coming to the dead end. There were fresh beaver signs here. I also remember that night because my bag was insufferably hot until after eleven, and the mosquitoes were quite active when I was uncovered. I resolved to carry a single blanket and a pair of long johns as my future bedroll for summer camping at this level. I also decided to purify the river water with tablets. I didn't object to a little mud, but the

San Juan and Colorado have caused me some real misery after a culture has had a few days to incubate.

On the sixth day I heard an unmistakable sound, outboard motors coming upstream. The occupants stopped and visited with me briefly before going on to test the feasibility of taking their club from Lee's Ferry to Rainbow Bridge the next weekend. On their way back they picked me out of the water just below the mouth of a creek with an interesting name, Last Chance. I saw the rest of Glen Canyon at a faster clip. On my own I had been covering an average of twenty-four miles a day.

In recent years my hobby has been to work out old trails and climbing routes in the Grand Canyon, and I have used my air mattress to cross the river wherever I found it necessary. It was not until late August of this year, 1960, that I tried another longer trip. I carried my pack down the access canyon from the southeast to Badger Creek Rapid, two miles below Navaho Bridge on old Highway 89. This is near the beginning of Marble Canyon, famous for drownings in the Brown-Stanton railroad survey party. Mute evidence of another tragedy is the boat in which the grand old man of the Colorado, Bert Loper, shot his last rapid. He either died of a heart attack before he lost control of the oars, or his eighty-plus years were finally too much of a burden and he lost control and drowned. His body was never found, but his boat was pulled up to high-water mark and tied to a mesquite tree forty-one miles below Lee's Ferry. This is the canyon where the river surveyors said the walls rise 2000 feet in the first twenty miles, one-tenth due to the drop in the bed and nine-tenths due to the rise in the plateau.

Instead of finding the twenty-foot waves mentioned by Grant, all I saw were little ones about two feet high. Still, they formed splashy breakers that could wet your hair if you chose to ride them. Even from a distance I could tell by the sound the places where single rocks cut through to the surface as against a real drop in the bed. Rocks breaking the surface sounded like tearing paper, while a drop in the whole river made a roar like a fast freight. When the noise ahead signaled a real rapid or riffle, I always took care to get out and walk. There was one exception. As I approached Sheerwall Rapid I thought that both sides furnished good detours. I approached the right bank, and it was only when I was too close to turn back that I realized that one could not get out. I tried a landing instead of using my chance to stay clear of the rocks, and I was swept over the drop right against the rocks. The only casualty was a scraped shin and some water in my pack. This was the only misadventure, unless you count three times when I misjudged the depth and let my mattress scrape over water-polished boulders.

These minor problems were to be expected, but I was really surprised by the scenery and points of interest. There were long stretches as quiet as a millpond where the cliffs rose 2500 feet with hardly a ledge. You don't expect waterbirds in the lower Grand Canyon, but here I saw herons, ducks and one sandpiper. There were fresh beaver cuttings, and ringtail-cat tracks in the sand. Twice I camped on sand at the top of a talus which was entirely cut off by the river on one side and a vertical cliff on the other. I didn't see a single ant or a common fly along here. The only mosquitoes that found me were downstream at my last campsite in the national park. One time I had to yell at a coyote to get him to quit watching me with so much curiosity. He was a beautiful, sleek specimen, a real contrast to the pathetic animals seen in a zoo. He seemed to know that the awe-inspiring canyon was his home and not mine.

There were too many points of interest to give them in detail. There was House Rock Canyon, where an amateur climber can get out to the plateau. I went up past the first three tricky spots and assured myself that I had the Supai formation below me. There was Stanton's Marble Pier, the first showing of the Redwall Limestone, which Powell thought was at least partly marble. This would be under water at flood stage, but when I was there it was glistening in the sun, exhibiting an odd brownish-gray color, and the pitted surface reminded me of something which I finally recognized as the surface of a meteorite. The next eighteen miles formed the most distinctive part of Marble Canyon, for the Redwall Limestone loomed higher and higher in perpendicular walls. Either one side or the other came up straight out of the water, and sometimes there would be no landing on either side, but at these places the water was always quiet. Exposed at low water were intriguing sea-caves cut back under the walls. One can imagine how the current swirls through them at flood stage. Most impressive were driftwood logs lodged in crevices forty or fifty feet above the calm surface of these pools. One especially broad cave, known as Redwall Cavern, has a sand beach running back into it. The Kolbs, on their 1911 trip, thought that it was too fine a campsite to pass up, but when I was there a localized sandstorm was raging. Ravines coming over the edge of the Redwall have carved fantastic chambers and Swiss-cheese tunnels in the rock. I camped in front of such a grotto, fifty yards in diameter with only a narrow exit to the river. The floor was covered with small pebbles. The ceiling was a half-dome with the spout of a stream, dry most of the time, ready to pour a 300-foot-fall into the middle of the grotto. At another place was a small cave, below the highwater level, which in 1922 held a cache of trappers' supplies. In front of a shallow

cave at the top of a talus was an Indian ruin, and a few yards away a headless skeleton lay bleaching in the sun. This was near Vasey's Paradise, a place where the usually barren walls are covered with a rank type of vegetation because of a series of springs in the vertical cliff. Nearby were found the first examples of the split-twig figurines, deer-like images made from willow wands. By the carbon 14 method of dating, it is known that Indians were here about 3500 years ago. The Grand Canyon region, so deserted at the present, has seen several waves of occupation. There are over four hundred known prehistoric sites within the park boundaries. Besides the Indians whose only traces are the split-twig figurines, there were the pueblo builders from 900 to 1200 A.D. White men began coming about eighty years ago. Prospectors and others, whose activities ranged from stealing horses and distilling moonshine to growing fruit and vegetables, gave the canyon a look of impending civilization. However, when the Park Service took over in 1919, only a few were left. They were trying to make a living by guiding pack trips or by operating a few mines whose only profit was from the sale of stock.

My mileage had been poor, especially the first day when I stopped early to dry out my pack after the mishap at Sheerwall Rapid. The current was so slow in the long, quiet pools that I was able to cover only twelve to fourteen miles a day. On the fourth day, however, landmarks began to occur with surprising despatch. Well before noon I came to President Harding Rapid, with the big rock right in the center of the narrow channel. I began to look for the familiar Nankoweap Mesa at the northeast corner of the national park. Before 4 p.m. I was sure I recognized its northern gable. I still had time to explore Little Nankoweap and confirm the statement that only an expert climber could get out of its box canyon. After going downriver four more miles the next day, I hiked for eight hours in the Kwagunt drainage but failed to find an extensive Indian ruin which was reported thirty years ago. My last day on the river consisted of easy floating and walking down to the base of the Tanner Trail below Desert View. Parts of my equipment were showing wear, but on the whole I considered my system of backpacking down the Colorado a distinct success. If there is a better way to see terrific scenery while keeping cool all day, keeping warm at night with very little bedding, portaging a five-pound boat that you can sleep on at night, I would like to hear about it. I suppose the next thing will be to ride a surfboard through the canyons.

PERU 1960

by HENRY W. KENDALL

THE 1960 NORTH AMERICAN ANDEAN EXPEDITION is the most recent of a series of expeditions to the main range of the Andes in Peru, the Cordillera Blanca, all staffed in part by Californians. The 1958 expedition, of which I was a member, climbed in the northern part of the range in Quebrada Alpamayo ("Quebrada" is the Quechua Indian word for a deep narrow valley that gives access to the mountains) and in Quebrada Uta. While in Quebrada Alpamayo we had been saddened by the death of one of our companions, Walt Bailey, who contracted pneumonia at high camp. Later, in Quebrada Uta, the expedition made a second ascent of Contrahierbas and climbed Huascarán (22,200 ft.) by a new and very long route from the southwest. During that trip a number of routes on other peaks were examined, among them a new route on twice-climbed Chopicalqui (21,200 ft.), the third highest peak in the range, and a possible route for a first ascent of a peak unnamed on the maps but called by us Nevado Uta. Nevado Uta was one of the three highest unclimbed peaks in the range. In the winter of 1960 I was making plans to return to this area and try some of these climbs.

Two climbers from the Naval Ordnance Station at China Lake, California, Carl Heller and Ernst Bauer, had, unknown to me, also organized a visit to the Cordillera Blanca; when we learned of each other's plans we joined forces. Late in the spring two friends of Carl's were included also: John Lomont and Dave Brown, both from New York City. We agreed to hire three native porters from Huarás, near the mountains, to help us move our many hundreds of pounds of equipment into the mountains and to establish high camps. Since I was the only one of the group who had been in Peru before, a substantial part of the problem of buying community and porters' equipment fell to me; the month of April saw an increasing number of bags and bits of duffel and a growing pile of correspondence accumulate in my house as the time approached for the sea shipment of the expedition supplies.

Between the 1958 and the 1960 expeditions Dr. Charles Houston, veteran of two American K2 expeditions, recognized that the "pneumonia" that had killed Bailey and a number of others on trips to very high altitudes was in fact a congestive heart failure, which explained why the ailment had failed to respond to antibiotics. A correspondence with Dr. Houston and talks with Dr.

HENRY W. KENDALL, a member of the Club, is on the teaching staff of the Physics Department of Stanford University, California.

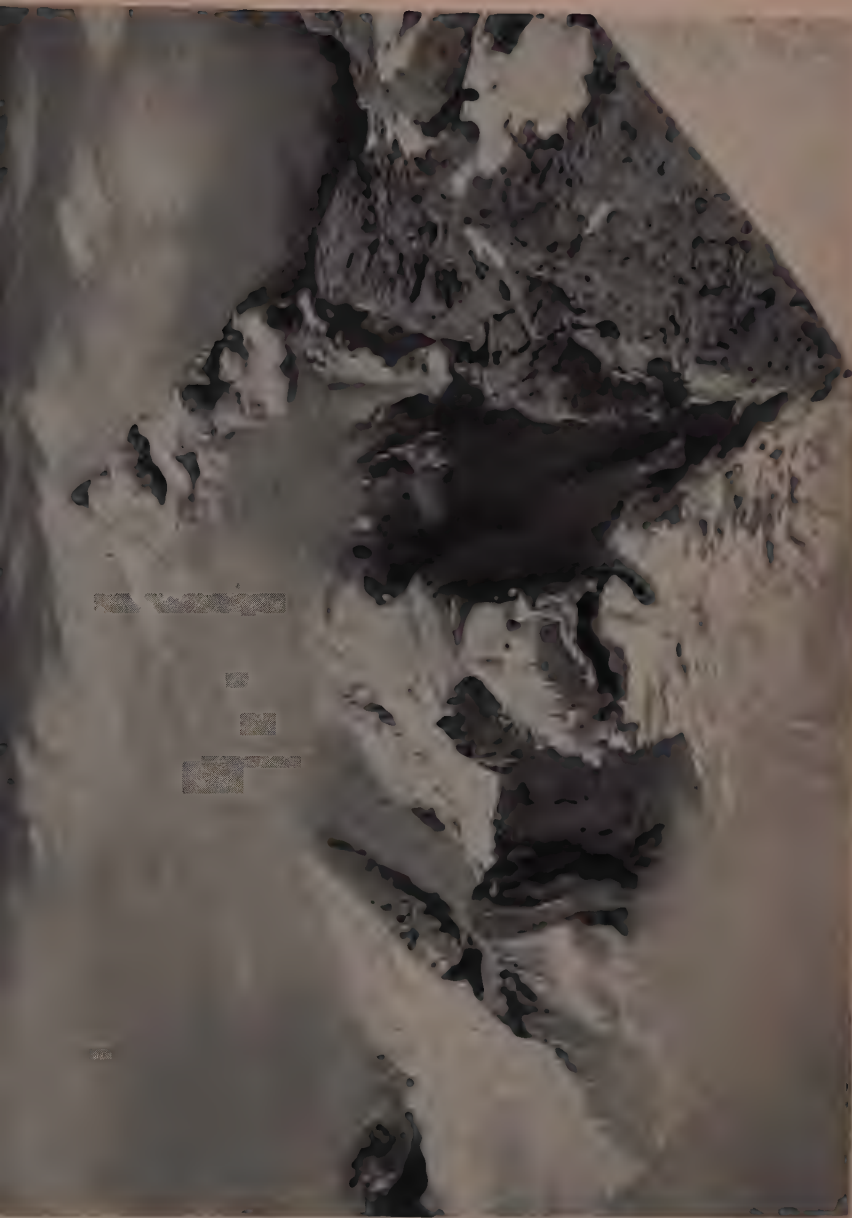
Art Ortenburger enabled us to stock the medical kit with special drugs and to outline diagnostic and therapeutic procedures to meet any attack of this serious ailment.

By June 28 we were assembled in the small town of Carhuás with our porters, Macario Angeles, veteran of half a score of expeditions, Octaviano Zuñiger, and Pablo Morales. We had eleven pint-size burros and five horses to get our equipment the 20 miles to our first base camp in Quebrada Uta. Two *arrieros* (native animal drivers) went in with us to return most of the animals to their owners after establishing base camp. We kept the horses and a few burros with us in the Quebrada in case of emergency and to help move base camp.

By July 2 we had a high camp at about 14,000 feet near the lagoon under Chekiacraju. The next day the expedition made the second ascent of this peak, first climbed by members of the 1958 expedition. We then turned our attention to an unclimbed, unnamed peak also accessible from high camp. Carl Heller and I succeeded in establishing a route to the summit ridge. The last part of the route we completed involved a 600-foot pitch of extremely steep snow overhung with the typical Andean cornices. We had to cut a hole through the cornice at the top of the slope. During the descent in the afternoon we were pelted with ice fragments melted free from the cornice by the sun.

The day when we were to establish a second high camp, from which to push to the summit, the emergency we had half expected occurred. Ernst Bauer, who had been showing increasing signs of fatigue and lack of acclimatization, developed congestive heart failure. Digitalis and the other drugs came out of the medical kit and within a few hours he was on a horse, with Macario and me accompanying him on foot, on his way to lower altitudes and medical care. We got a taxi from Carhuás to Huarás, the largest town in the area, and by midnight he was under a doctor's care. At the lower altitude, with rest and comfortable quarters, he was soon out of danger.

I returned to the expedition and the problem of the unclimbed peak and its slope with the ominous cornices. There was no alternative route to the one we had made. We established our second high camp and while there with Carl Heller I was taken sick. Although my ailment was not so serious as Ernst's, our recent experience suggested some caution and I went out to civilization to rest for a few days, while the others moved base camp to Chopicalqui and made the preliminary route-findings to establish a high camp and a route from the Huascaran glacier up the icefall onto the west ridge, joining there the route used by the two previous parties coming from Quebrada Yanganuco to the northwest. The danger of the route on the unclimbed peak, the absence of two-fifths of the expedition, and the limited time re-



CHORICALQUI FROM THE SOUTHWEST SADDLE ON HUASCARAN

Henry W. Kendall



ICEFALL LEADING TO THE CHOPICALQUI RIDGE

Henry W. Kendall



Henry W. Kendall

SUMMIT OF CHOPICALQUI FROM ABOUT 19,800 FEET



Henry W. Kendall

RECONNAISSANCE ON ULTA RIDGE AT 17,500 FEET

maining to the group made the decision to abandon the attempt on the unnamed peak a reasonable one.

By July 13 Ernst had regained his strength and he and I had returned to Quebrada Uta to the new base camp. Carl, Dave and John had established a high camp at about 17,000 feet on a tongue of rock that separated the great glacier below the cliffs of Huascaran from the glacier under the wall on the south side of Chopicalqui, and when Ernst and I arrived there the next day the others had already spent two days in working on the route leading up to the west ridge. There had been an unusual amount of poor weather in the Cordillera Blanca in both June and July, with rain and snow falling almost every afternoon. The icefalls above the glaciers on both sides of our high camp avalanched day and night, an unusual phenomenon in the Cordillera Blanca.

There was no feasible route from the Huascaran-Chopicalqui saddle onto the west ridge, for an unclimbable spine of rock interfered. It was necessary to bypass this by climbing up an icefall out of range of avalanches from the rocky spine. The climbing was hampered by accumulations of powder snow up to four feet and more in depth; this had to be dug away laboriously and fixed ropes installed on a number of pitches. Snow stakes, used to install these ropes, had to be driven in as much as six feet, and even then would occasionally be insecure.

We had powerful transistorized two-way radios that kept us in touch morning and evening with the porters at base camp, so we had little difficulty in arranging an orderly delivery schedule of goods and equipment required at high camp.

The extremely hard work in the thin air had seriously fatigued both John and Dave, and both felt they would be unable to reach the summit under the existing snow conditions. After resting a day they decided to head out to Lima, leaving the mountain to Carl, Ernst and me.

By the end of the third day we had reached the west ridge and were still trenching in knee-deep or waist-deep snow and installing fixed ropes to protect the precarious steps kicked into the steep pitches. Since by the end of the third day we thought we were within striking distance of the summit, the next day we got up at 2 a.m. for a summit try. We hadn't reckoned with the mountain, however, for up out of sight of our previous route followed a succession of pitches steeper than anything we had come to on the ridge and soft with powder snow. We reached the top of that section at 3.45 p.m., after having installed all the fixed rope we were carrying, to be confronted with an overhanging ice wall cutting off the entire ridge. This ended the climb for that day and we retired to high camp to rest and figuratively lick our wounds.

Two days later we made another summit try, reaching the ridge before sunrise and the ice wall by 11.30 a.m. We were

above 20,000 feet and the weather was very poor. We were in solid fog, it was snowing, and we could catch glimpses of rushing cloud that spoke of high wind on the summit ridge. It took several hours to traverse the foot of the ice wall, where ice pitons and constant belaying were required. Turning the end of the wall, we made a climb of two pitches on steep, uncertain snow on a slope that rolled off beneath us to the cliffs of the south face of Chopicalqui. The wind on the exposed ridge was so strong that on the two different belay spots the belayer had to dig holes to protect himself totally from it. More fixed rope was installed on this slope.

We traversed the ridge toward the summit cone and reached the base of this at 2.15. Here we discovered that the route described by Fred Ayres and Leigh Ortenburger had fallen away in the six years since their ascent and again we were cut off by an overhanging ice wall. The only access to the summit was by a vertical ice wall down the ridge on the south side.

We tried to install a ladder of ice pitons to climb the wall 6th class but the ice was so rotten the pitons could be torn out by hand. There was nothing we could do but look at the summit less than 100 meters away and turn back. The wind seemed as if it was trying to tear the top off the mountain and we were cold and fatigued. We returned to high camp and radioed the porters to come up on the following day to help us pack out.

We were about at the end of our stay in Peru but we took three days to try to find a route on Nevado Uta. We moved base camp to a spot under the ridge between Nevado Uta and Contrahierbas and established a high camp at 17,500 feet altitude, 250 feet below the crest of the ridge. Two fixed ropes, some ice pitons and many steps cut and kicked in the ice and snow were required to reach the ridge. The route was largely overhung with cornices and required some care. (In the fine weather of 1958 George Whitmore and I had reached the ridge at the same place, unroped, safely and easily.) Ernst Bauer and I descended the other side of the ridge into Quebrada Cancaracá Chico, meeting the inevitable deep powder snow and having to fix more permanent rope. A traverse route from here to the base of Nevado Uta was cut off by a series of icefalls and a rocky cliff which might have been passable given more time, but the end of the expedition was at hand.

As an expedition we had not done badly, in spite of bad weather and sickness. We had climbed one mountain and had made a respectable showing in establishing a new route on one of the major peaks of the range. Nevado Uta remained unclimbed. Now that the New Zealand expedition has climbed the spectacular Cayesh, only dangerous Chacaraju East and Nevado Uta remain as major unclimbed summits in the Cordillera Blanca.

EARLY TRAILMAKERS AT RANDOLPH AND THE FOUNDING OF THE R.M.C.

by ARTHUR STANLEY PEASE

ON THE FIFTIETH ANNIVERSARY of such an organization as the Randolph Mountain Club it seems appropriate to contrast its present state with the conditions which preceded its birth, and since my *conscious* remembrances of Randolph go back some sixty-six years, and my involuntary and assisted memories here began seventy-four years ago, it is permissible for me to beg the pardon of survivors of earlier date if I tell of things obvious and trite to them yet not so familiar to the rank and file of the Club. I shall not, however, try to duplicate the excellent chapter in Mr. Cross's *Randolph Old and New* which Mr. Louis F. Cutter prepared for the hundredth anniversary of the town in 1924. Mr. Cutter was nearer than I to the Founding Fathers of the Club and, like Mr. Cross, could draw upon memories, orally transmitted, from persons no longer with us.

The three decades from 1880 to 1910 formed at Randolph a period of exploration and expansion. Inheriting as we do an elaborate system of trails, maintained by the Club, the Forest Service and other agencies, we perhaps fail to realize the excitement, during the thirty years I have mentioned, which was produced by each new trail, making available places and sights previously little known. From outlets in the Randolph valley, reckoning from east to west, there were the Watson Path (made by L. M. Watson in 1882), the Air Line (constructed in 1885 by W. H. Peek, E. B. Cook, G. A. Sargent and L. M. Watson), Lowe's Path (in 1875-6 by C. E. Lowe and W. G. Nowell, the latter of whom provided the tiny distance signs with measurements given in the metric system), and the Castle Trail (in 1883-4 by Cook, Sargent, Watson, Albert Matthews and Hubbard Hunt). These trails were made very largely by the labors of a remarkable series of guides and woodsmen, well characterized—as Sweetser's guide does for Charles E. Lowe—as being "cautious, intelligent and companionable". On Mt. Washington the earliest trails were made by guides alone, for before adequate accommodations for travelers were available only the resident woodsmen would be on the spot for a long enough path-building season; but those trails in the Randolph region were the work at first of guides and visitors and later largely of visitors, such as Peek, Cook, Sargent and others. Again, the trails on Mt. Washington were primarily

This article is the major part of an address given by Professor Pease at the annual meeting of the Randolph Mountain Club, August 13, 1960, on the occasion of the Club's fiftieth anniversary.

bridle-paths, designed to increase the monetary receipts of the builders, while those on the Northern Peaks were made by pedestrians for the use of pedestrians. The experience gained in joint path-building enterprises was further developed when Peek and Cook undertook *by themselves* the locating of blazed trails, some of which, like the Sylvan Way and the Amphibrach, are still in use, while others were abandoned because they led where no one wanted to follow. Such were the wellnigh forgotten "N.J." and the Intermezzo Rusticano, which latter Mr. Cook, to whom puns were as regular and constant as breathing, marked at one end by a rusty can fastened to a tree. Some of these early trails, though not consistently kept up, have, like the Inlook and Outlook, been replaced by similar routes still in use. These simple blazed trails led the lovers of the then unspoiled woodlands where the lumberman's axe had never been brought and where the ground was deeply covered with moss and ferns. They were beautiful and rewarding to those who had the vigor to travel on them but, as one of the old guidebooks says of the big ravines, not to be recommended to delicately nurtured females—a category into which the Peek and Cook ladies fitted as little as do the modern ladies who scale the Four-thousand-footers.

Into this minor epic of trail construction there burst, in the nineties, the lithe figure of J. Rayner Edmands—not a professor, as some inexactly called him, but one of the staff of the Harvard College Observatory. With gray flannel shirt, gray golf stockings with red tops, and with a red sash about his waist and a bit of red at his neck, he matched the gray of his hair and beard. Mrs. Edmands had died young and, partly as a tribute to her memory, partly to assist others who, like her, had loved the mountains but had found the rude blazed trails beyond their strength to traverse, and perhaps not least because he himself enjoyed this form of out-of-door activity, Mr. Edmands began in the nineties a series of graded trails of an elaborate sort, demanding engineering experience as well as much time and money. With permission of the lumber companies holding the titles to the Northern Peaks, Mr. Edmands amplified and improved the Mt. Madison Path and constructed the Valley Way (and he was always very insistent that these two were not the same but historically distinct), and laid out from the start the Randolph Path,¹ the Short Line, the Gulf-side, the Link and the Israel Ridge Path. Laying out trails, whether in the Cook method or, less often, on the Edmands style, speedily became a favorite out-of-door sport. The extreme case was when an estimable summer visitor at one of the local hotels, who had lost her way in going to the Ice Gulch, purchased a little hatchet and, Carry Nationwise, determined to rescue others from

¹ See the letter at the end.—Ed.

the same perils. Unfortunately she blazed away in the wrong places and, as Professor Moore asserted, blazed every tree in the woods on all four sides. (This same lady, starting on a walk one summer morning in questionable weather, carried with her an attractive new parasol. She returned, drenched, with the parasol nowhere to be seen. In reply to enquiries, she pulled it forth from under her dripping skirts and explained that since it was so new and pretty she had not wanted to get it wet.)

Skilled in surveying and well provided with funds for hiring a crew of assistants in the heavier parts (for he was distinctly an employer rather than a colleague, even though he shared the work at many points), Mr. Edmands produced graded paths differing strikingly from the spotted trails of his contemporaries. His methods of procedure were these: (1) deciding the proposed termini of the contemplated trail; (2) starting from one terminus, and unrolling a large ball of white string on a stick and catching it loosely upon shrubs and low branches of trees along the intended route (or sometimes placing two or more different string lines, rolling up again those for the discarded routes); (3) selecting the most desirable string line, with reference to beauty, footing and gradient (for, unlike the makers of blazed trails, he tried to avoid any downhill on the way up, lest hard won elevation be sacrificed); (4) cutting out along the selected route, which often involved rather heavy felling of large trees (these were then used to brace up the downhill side of the path or were employed as waterbars or as bridges over small rills, depressions or boggy spots); (5) covering the bony skeleton of logs and stones with a deep filling of duff. The modern user of these trails, which have now been worn down to streambeds, finds it hard to understand the pleasure which was originally to be found in literally running and bounding down the elastically cushioned paths. (6) A last step was cleaning up the sides of the path and placing the very carefully planned and professionally painted signs, black-lettered on a white background.

To all these matters Mr. Edmands gave great personal attention and insisted that his plans be exactly carried out. Some of his more independently minded workers at times rebelled, like Eugene Hunt, one of his ablest, who had, however, been chided for little variations from plan (a deviationist, I suppose, he would be called in some quarters). "Gene," said Mr. Edmands one day about noon, "won't you go up the trail about a quarter of a mile and see if we didn't leave our lunches under a big white birch tree at the right side of the path?" Eugene went in silence and, returning after a long enough interval for the round trip and for lunch itself, remarked with a well-fed look and a twinkle in his eye, "Yes, we did". (It must be said, in justification of Mr. Edmands, that he overlooked the joke on himself and even told the story to others.)

After this lapse of years I may be pardoned for recalling that there grew up certain prejudices and factions between the Cook and the Edmands schools of thought, by reason of which Mr. Cook's family and friends disdained to walk on the too carefully manicured paths of Mr. Edmands and Mr. Edmands (who kept a room the year around at the Ravine House and so would not have been thought to give too little time to the local scene) boasted that he had never gone to Mt. Crescent, the Ice Gulch or the Pond of Safety, to visit which he would almost have been compelled to walk on some of the Cook trails—for Mr. Edmands a harrowing experience.

To furnish needed lodging-places near the Edmands trails their builder erected two birchbark shelters, Cascade Camp and the Perch, which, along with other interesting features, were unique among White Mountain hostelries in that a strong taboo was placed by their proprietor on the cooking or even the temporary transportation within their limits of cheese and onions. In the depths of these forest huts Mr. Edmands' life was as carefully ordered as in the most particular households. One day at Cascade Camp I surmised that it would be improper to toss into the fire-place the paper in which the Ravine House had wrapped my lunch. So I asked Mr. Edmands' advice. "Oh, toss it in the fire-place." But before I reached that he had changed his mind. "No, tuck it up under the roof." I did so, but a little later I saw him unfold it, refold it more carefully, and place it in a certain corner, saying, "A paper as good as this we keep up here."

Not only cooking but also dishwashing was done according to fixed principles. Mr. Edmands would have all camp dishes washed in cold water and wiped with moss. Dr. Nowell, however, at the Log Cabin, advocated washing in three waters, and he explained this theory to me as I stopped in for a few moments when he was clearing up his dinner dishes. I was a good deal impressed until I observed, it being a very hot day, that the dishtowel also served as a handkerchief against perspiration of the brow.

Dr. Nowell used often to speak of "my ridge" and "my peak", and on the two small summits of "my peak" (Adams 4, known also as Charles Francis Adams or Maud Adams), separated from one another by a depression of a few feet, he placed painted board signs, inscribed "Grace" and "Fred", for his two children. The main peak of Adams, however, was his specialty, and each year he made many ascents of it from the Log Cabin, where he spent his summers. Some sensitive souls thought it hardly good sport to count as a genuine "ascent" one starting at 3300 feet of altitude, and one party of climbers in particular felt somewhat annoyed at waiting in a high, cold wind while Dr. Nowell unrolled a good part of the register cylinder because he had neg-

lected to number one of these ascents, thus necessitating his finding and renumbering all subsequent ones.

One other group of Randolph pathmakers deserves special mention, namely, the small but active company centering around Kelsey Cottage (or the Mountain View House as it later became), consisting of Elliot B. Torrey, his father, the Reverend Joseph Torrey, his brother, Professor Charles C. Torrey, Professor George Foot Moore and his son Albert, and occasionally myself. This group were responsible for making and maintaining the Torrey Path, Pasture Path, Diagonal, Via Sacra and Spur Trail. Elliot Torrey, the shyest of the number, was of them all the most original and artistic, and constructed walks, especially on the Randolph hillside, of great beauty—an achievement of which his gravestone in our cemetery gives no indication.

It will be seen that the paths and trails I have mentioned and others like them were largely the work of individuals and depended on the voluntary service of individuals for their upkeep, in some cases easy, in others difficult. Further, since the stalwart guides were growing older or busy with other tasks, these individuals became more and more limited within the number of summer visitors to Randolph. Again, cooperation among the three principal groups of Randolph pathmakers—the Peek-Cook, Edmands and Torrey groups—had never been effected or even, I think, envisaged. The local situation might perhaps be compared with that of the original thirteen American states before their union. But this was a time in which cooperation was especially needed for, from about 1903 on, an intensive cutting of the fine timber on the northern slopes was being prosecuted by the lumber companies, and it was no longer a question merely of injury to the various trails but of the destruction of the forests themselves. Some concessions were obtained by Mr. Edmands and Professor Hincks from personal friends in the Brown Company, but these were not adequate, and Mr. Edmands transferred his trail-building activities to Bretton Woods, where private ownership by the hotels spared considerable areas from the axe. His plan was said to be to return to Randolph when the lumbering operations on the northern slopes were ended. But in 1910 Mr. Edmands died, and for his trails and those of Mr. Cook and the Torreys there was lacking the financial and managerial enterprise which might have been forthcoming from younger men. In 1910 John H. Boothman, Senior, urged that some organization be formed to restore and maintain the scattered remnants of trails and camps. Consequently, in August of 1910 the Randolph Mountain Club was established, with Professor Hincks serving as its first president and continuing as such until 1922.

The Club was fortunate, especially in its infancy, in that, among the various factions I have mentioned, its management

was headed by the irenic Professor Hincks and ably supported by the generous services of Louis F. Cutter and Eldredge H. Blood, who through the rest of their lives had the time and energy to devote to its interests. Fortunate, too, was the fact that, as with the more populous Appalachian Mountain Club, interests were not limited solely to the building and maintenance of trails, in which many of the members would have been unable to participate. Even during the period of Cook and Edmands it was needful to have not only trailmakers but also trailwalkers, and for their guidance a set of little guidebooks and maps. Randolph has long figured as a center for climbers and a large part of that mountaineering spirit has been based on the facilities and encouragement furnished by the Club.

From a very early period in its life this Club, like the A.M.C., has interested itself in exploration, not merely of the mountains bounding the Randolph valley but of outlying ranges. Among the peaks visited by Club parties have been Black Crescent, Waumbek, Round Mountain, Terrace, Cabot, the Bulge and the Horn, Rock and Burke in Vermont, Cape Horn, the Percy Peaks, Sugarloaf (in Stratford), Sunday River Whitecap and others in the Mahoosuc Range, Rumford Whitecap, Zircon, Aziscoos, Bowback, Megantic (in Canada) and many others. Along with the cult of 4000-foot mountains there might well be established a canon of rarities, in which some of those listed might belong. So strong was the pioneering spirit in the Club, with such members as Louis Cutter and Eldredge Blood, that new trails were laid out in such then wild country as the Mahoosuc Range. Gradually, however, it was realized that the Club should not burden itself with a large mileage of trails distant from Randolph, and a happy exchange of several trails of the more remote sort was made with the A.M.C., which passed over to us some paths nearer home.

Growing out of the excursions were the Club picnics, especially the annual picnic with dramatic features in the form of charades, in which Valley, Hill and Midlands compete. It was early found that picnic sites at a high elevation, or dependent for access upon difficult trails, were hard or impossible for the less vigorous members, and so that their participation might not be excluded the annual picnics have come to be celebrated regularly at Cold Brook, which is accessible to almost all members who are not actually hospitalized. To satisfy the ambitious desires of the more active, an annual Rendezvous has been observed high enough above the sea to escape the perils of seasickness. For those necessarily absent from Randolph at these times it has been customary, with hospitality extended by the Mt. Crescent House, to hold an out-of-door tea on the Fourth of July.

Increasing mileage of trails and the ageing years of members no longer in their youth have made trail maintenance a growing burden. Wisely, therefore, the Club has followed the example of the A.M.C. in organizing a group of capable and responsible school or college boys who can be induced to keep our trails in what we or the Forest Service consider to be proper condition. Similarly, we have followed the A.M.C. in having our camps also cared for during the walking season by similar responsible agents.

In these respects our Club has worked in close collaboration with the A.M.C. and the Forest Service. I think you will agree with me that the Club has been an effective and valuable unifying force in the community, providing at the same time for esprit de corps and for a variety of individual interests. In this combination of unity and variety may the next fifty years be as successful as those just completed.

EXCERPT FROM A LETTER TO PROFESSOR CHARLES C. TORREY. From his father, the Reverend Joseph Torrey, July 28, 1898. (Professor Torrey's daughter, Mrs. Alfred J. Frueh, has kindly made this available.)

“. . . I was astounded the other day by Mr. Grover's writing me that the path from Randolph Station to the Tama Falls was an accomplished fact—done by *Mr. Edmunds* [!] in his *best style*. (I think Mr. Grover must have told him last fall that we were proposing to make such a path.) Well, that will save us a sight of work—and Elliot and I can lay out our strength on the Crescent Mt. path—which you began last fall.

“This *Tama* path, which Mr. Edmunds calls the ‘*Randolph Path*’ strikes in just where you and Ell and I struck in last year the first time we began the survey—in that clearing near the way to Coosauk falls. Beyond Tama the path takes a course to the junction of Air-line and King's Ravine paths—and thence across to the Gulf-side. . . .”

EXPEDITIONING IN THE NORTH SELKIRKS

by PAUL DOHERTY

WHEN BILL PUTNAM ASKED ME to be a member of his 1960 expedition to the Selkirks, to say I was extremely pleased would be putting it mildly. I accepted the invitation the way a beagle takes after a jackrabbit.

I have known Bill for quite a few years. Since, in fact, the days when, wearing his traditional black Stetson, he used to frequent the Pinkham Notch area with his old side-kick, Skagway the malamute. Since those days I have come to know Bill well, both during search and rescue details, and at A.M.C. Mountain Leadership Committee meetings.

As the departure date drew near many things passed through my mind. Should I be able to keep up where physical ability was in question? I am not an old man, to be sure, but I wondered if that old saying, "Life begins at forty", would prove true in this instance.

July 27 arrived and by dawn's early light we began to load our gear into Bill's new station wagon at his home in Springfield, Mass. First we loaded that large compartment below the floor in the rear of the wagon. "Hey, Bill," I said, "where are we going to put the spare tire if we fill the tire-well full of stuff?" "Spare tire!" replies Bill. "We're not taking any spare." To myself I thought, oh brother, across North America and back and we don't have a spare! I don't even drive from Gorham to Berlin without one.

Five a.m., the wagon is loaded, Putnam is at the wheel. Out of Springfield and onto the Mass. Pike we roar. The party, at this point, consists of Dr. Ben Ferris, Louie Stackpole, an elkhound named George and one gamewarden from up near Mt. Washington who vividly remembers a remark Putnam made several months before in reference to this trip: "It won't be any kindergarten".

All day we roll along, with a sharp eye out for those guys called troopers. We stop only when gas is needed, eating cold corned beef as we fly low across New York and then the Great Lakes and on into Canada.

Thirty-three hours and 1700 miles later we are at Winnipeg, Manitoba. On we fly towards the west, across the great Canadian

PAUL DOHERTY, a Club member, is a Conservation Officer for the New Hampshire Fish and Game Department, working in the Gorham-Berlin-Shelburne area. His territory includes the slopes of the Presidential Range from Spruce Hill to Jefferson and it is a rare mountain rescue—in his own territory or outside it—in which he does not take part.

prairie, until some 57 hours from our starting-point we arrive at Golden, British Columbia.

At Golden we meet the others who are to put their faith and trust in Putnam during the three weeks to follow. Three weeks that are to take us into a region that is unmapped and, in most cases, unexplored. A section of mountain country where only a few of the peaks have been climbed or even named.

The others joining the party at Golden are Warren Blesser, Steve Smith, Jed Williamson, Johannes Trapp and Bill Herlihy.

We now learn that the Province of British Columbia is afire from one end to the other. Some 475 forest fires are burning. This calls for a change of plans; the national parks are closed, even Putnam can't enter. We drive for some three hours over the Big Bend Highway to Downie Creek. The dust, as we roar along, covers everything. The art of simple breathing becomes a task. Into holes, out of holes, off the seat more than on it. What a feeling to see the lights of Ed Wallis's cabins at last.

Early breakfast. "Eat up, boys," shouts Bill, "you won't see bacon and eggs again for awhile."

Expedition gear is laid out and Our Leader decides who gets what to carry. My lot, 30 pounds of sugar and 10 pounds of other food. This brings my pack to 90 pounds plus. I now weigh, pack and all, 290 pounds on the hoof. A month later my pack will be 40 pounds and I 20 pounds lighter.

Into the wilderness we head, following an old miner's trail. The day is very hot, the pace a good one, the rest stops almost none. By mid-afternoon my pack weighs 300 pounds and I have suggestions of leg cramps. An hour later the cramps are bad. Ben Ferris says that said cramps are the result of the heavy sweating I have been doing. By late afternoon my pace has slowed to a crawl. We cross a slide area and I tell Bill I don't think I can go any farther. Bill replies, "You stay on your feet, you buzzard," in a tone that has the lash of a bull-whip. On I struggle and in about a mile we make camp between two glacial streams.

Next day we push on. I am happy that my leg cramps are gone and that Putnam didn't let me quit when I was ready to.

We climb over snow and reach a high pass. Bill has said we shall be able to stay above timberline and reach the Carnes Glacier with ease. The high pass where we now stand proves that the Selkirks are a hard land and even W. L. P. can't always guess the route. It is impossible to reach the Carnes Glacier without going down, down, down and then up, up, up.

Down we go, make camp in an alpine meadow at about 8000 feet, and the next day push on again. All morning we fight our way downhill, then eat a meager lunch of sardines and chocolate and start uphill, following a steep, dry watercourse. By mid-afternoon everyone is mighty tired. Bill drives the party on and

on, the rest stops are few and short. Finally we camp in a jumble of rocks high on the ridge. Darkness has forced us to stay here, otherwise our leader would have pushed ahead.

Next day we reach timberline and make camp in sight of the great Carnes Glacier. This is a delightful spot. Water, firewood, snow, ice, towering mountains and sky all rolled into one.

From this camp we climb, spend time on the glacier, observe wildlife. I saw three grizzly bears. George the elkhound dragged one into camp and we ate it. And it was here we made the trip's first ascent, my lifetime first, naming the mountain Fog Peak because we climbed it in the fog.

The elkhound George was mighty hungry until the bear meat came into the picture. Nothing in the line of food was included for the dog; his lot was to lick the pots and pans. By the time the bear died his ribs were beginning to show. He ate for two days on the grizzly, however, and grew fat and lazy.

I might, here, mention the expedition food. For the most part it was of the dehydrated kind. Very good, I can report, except that for a woodsman like myself, who lives on red meat and potatoes, the portions lacked the bulk that I am used to. Expedition cook was Ben Ferris, who did an outstanding job.

At this point Warren Blesser and Bill Herlihy head back to civilization due to conditions of health. Much discussion on their going back alone was done by Ferris and Putnam before the final decision was reached.

From the Carnes Glacier we push on. First up a steep slope of loose stone, then over a high pass and down an unnamed glacier into timber, and finally after many hours of hard bushwacking we reach a brawling glacial stream.

Ben Ferris tries to cross to a log jam. The water upsets him and he is hauled ashore looking like a half-drowned raccoon. We bushwhack downstream in search of a crossing site. Find none. Decision is made to cut a 3-foot hemlock to bridge the stream. Ferris, Putnam and Doherty take turns chopping the tree down, using my 1¾-lb. Hudson Bay axe. Tree finally crashes to earth, bridges stream, but is carried away by the force of the water. A second, larger tree is cut down; this too is carried away by the force of the water. (I might inject here that Putnam issued an extra chocolate bar to each of the three choppers between trees.) The time is late afternoon by now and there is nothing to do but continue to bushwhack downstream, hoping to find a place to cross. Just before dark a huge blow-down tree is located that offers a natural bridge. All get over but Gorgeous George the elkhound, who refuses to follow. Putnam gets a rope around said beast and across Dismal Creek he comes.

More hard bushwhacking up a steep mountainside with Bill

cracking the whip and driving the party ever on and upward. By late in the day everyone is ready to make camp but W. L. P., who is determined that we keep going. At last we reach a beautiful spot beside a lovely stream and camp in a meadow filled with flowers. Once camp is made and a hot meal devoured, I, for one, am happy that slave-driver Putnam kept us moving until this wonderful spot was reached. I think the others shared my thoughts.

Several days are spent here, with climbing and resting left to each man's own decision. Mt. Baal is climbed, and an attempt on Moloch made but no safe route found. This is the second time Bill has decided against a final climb when snow conditions were not considered safe. This man drives hard, but takes no chances.

We are camped beside a small lake. Larger Downie Lake is not far away. A wonderful campsite, truly a wilderness spot where no man has ever cut firewood or spread a sleeping-bag before.

Before we leave this camp I make my second first ascent and wish to name this peak, that overlooks a land of Alp-like mountains, glaciers, waterfalls and deep valleys, Mt. Barbara in honor of my wife. When I mention this name to Bill he remarks, "Mt. Barbara it shall be!"

We leave this spot and are working our way up over a long glacier when several mountain goats are spotted. What a sight to see these animals! White against a barren brown ledge, jumping from rock to rock, going where a man without rope and iron could never pass. One, about a two-year-old, for some strange reason lost his footing and ended up dead on the glacier. Having had no fresh meat for over a week now the seven Selkirkers unanimously decided to eat this goat.

A large cairn is built at the head of the glacier and Goat Pass and Goat Rocks are so named. This is only one of the several large cairns that we constructed on the trip. The Putnam-type cairn is a masterpiece of stone masonry. Large of base, tall, and with a window about three-quarters of the way up. They stand throughout the Northern Selkirks as monuments to Colossal Enterprises.

For two days we feast on goat meat. We eat it broiled, boiled and stewed. Even cook the bones and drink the broth made from them. This wild meat is indeed a needed change from the small portions of dehydrated food that is standard bill of fare.

Here, too, I'd like to say that by now, after some two weeks in the mountains, on the move almost every day and carrying heavy packs over some of North America's roughest country, I was feeling the lack of heavy food. My 200 pounds had dropped by at least ten and two new holes had been made in my belt. I don't think I was alone in this respect. Everyone showed a loss of weight (except Bill, of course). and all were feeling the results of

the small meals we were eating. Standard noon lunch, for example, was three and one-half sardines and a chocolate bar per man. This was mighty small rations for men who were bushwhacking, climbing over rock and loose stone, and crossing great alder slides and roaring streams twelve hours a day. I remember telling Ben Ferris late one afternoon, when the going was tough, "I'm like an old horse. Throw me the hay and I can pull the plow all day and night. Without the hay the furrows are less and less." Everyone was wearing down at this point.

We reach Tangier Summit, camp, push on to Sorcerer Pass and camp. It's here Putnam decides to shorten the trip by a couple of days and "beef up the groceries". Down deep I think this iron man of the ice axe, piton and climbing rope was also like the old horse who wasn't getting enough hay to pull the plow. He never said so, mind you, but I might just be correct in my thinking.

At this point in the trip we notice much smoke coming up from the valley below. Steve Smith scouts a bit and reports a large forest fire down there. We now have food for six days only. Bill has decided on a route that, he thinks, will take us around the fire, keeping above timberline and letting us work our way toward the Columbia River and the point where we hope to reach the highway. He feels in his Selkirk bones that if we climb the mountain we are camped on we can cross to the northeast and travel on snow to the distant ridge we can see, and thus make our way out to civilization, missing the forest fire in doing so.

Climb this peak we do. It's steep, rough and tough going. I get hit by a falling rock, Ben Ferris almost goes to the happy hunting grounds when a large stone roars down a chute in which he is climbing. We reach the crest at last and find, what I was certain we would, no possible route down the other side. Bill remarks, "Well, boys, I can't be right always". Ben, in a loud voice, says, "Folly Peak, here we stand". Folly Peak it becomes and a cairn is built.

We have no choice now but to head down into the valley, pass the fire and thus make our way out. We climb back down where we climbed up that morning and camp near timberline. The next day we struggle and slip, fall and roll down that steep mountainside, keeping a ravine between us and the fire, which we can now see very well. Late in the afternoon we pass the head of the fire by a quarter of a mile and I sigh with relief when we have put some distance between us and this big smoke.

This fire, I might say, had burned over several ridges and when we passed it was burning downhill, against the wind, in large timber. We later learned that it had been burning for almost two months. The region was so remote that the forestry people had made no attempt to fight it.

I think, of the seven men in the party, I had more apprehension about this fire than anyone else. My lifetime in the woods has brought me in contact, on many occasions, with forest fires. I know what they can be like, what a force they can be under certain conditions. All my past knowledge came to mind as we hit the valley floor and the fire area. We were in what could be a bad spot. There was only one way out and we had only five days' food left. The fire must be passed. We must gamble on the wind not changing and increasing in speed.

On we push through a forest of big cedar and heavy undergrowth. Going is slow and for two days it rains. Each day we make camp near dusk. On the afternoon of the fifth day we reach the Big Bend Highway, tired, hungry and much in need of a bath.

It was a wonderful trip. The country one must see to appreciate. Words fail me for an adequate description. The forests are tremendous, as is everything in the Selkirks. The wildlife I enjoyed to the utmost. I thrilled at the sight of the great grizzlies and the mountain goats. Twenty-nine species of birds were identified. To a woodsman raised in the mountains of New Hampshire this trip was worth a great deal. I shall long remember my Selkirk adventure.

In closing I can only say this: Putnam is a never-ending source of amazement to me. He swings an axe like a French-Canadian lumberjack. He never runs out of steam. He pushes hard and has reason for this push, but there are times when the men he leads would like to feed him to the elkhound. But he never fails to come through. He will go first over the bad places and handle the rope in the difficult spots. He knows mountains inside and out; he is as much at home in a trackless forest as he is on a steep alpine snow ridge. Yes, indeed, I would go expeditioning again with W. L. P.

THE LOGGING RAILROADS OF THE WHITE MOUNTAINS

by C. FRANCIS BELCHER

PART III: THE SAWYER RIVER RAILROAD (1877-1937)

BY SUPERFICIAL COMPARISON WITH OTHER LOGGING RAILROADS of the day in the White Mountains this lumber railroad, which ran eight twisting, lonely miles up the narrow valley of the Sawyer River above Bartlett at the south end of Crawford Notch, was small. Only one other, the Little River R.R. (see APPALACHIA, June 1960, p. 46), was shorter. Most of the other sixteen lines in the mountains were at least double in mileage, and the majority of them would freight out logs from much larger watersheds than the 30,000 acres served by the Sawyer River line. Here, however, shallow comparisons end. For the Sawyer River R.R. was probably the biggest little logging railroad of its day. Why?

The Sawyer River R.R. was the story of the Saunders family; it was the alpha and omega of the 75,000-acre township of Livermore; its owners were the *only* operators by rail of their era to follow a continued policy of selective tree cutting; its presence and that of its owners ultimately stabilized the ill-defined boundaries of New Hampshire's land grants more than any other single factor; and it operated over a longer continuous period, under the control of one management, than did any other similar line—in fact, it was the second logging road built in the mountains and the second to the last to discontinue operations. The story of the Sawyer River R.R. can be best told by closer examination of some of these statements.

THE SAUNDERS FAMILY

The Saunders of the Sawyer River R.R. stemmed from Daniel Saunders (1796–1872), the founder of the city of Lawrence, Mass., and the constructor of the vast dam and waterway system which preceded the building of the miles of mills for which this city has been famous. Ultimately many thousands of board feet of primeval spruce and fir from the Sawyer River watershed would go into the growth of Lawrence. While this Daniel Saunders himself never did get into the lumbering business, his sons Charles W. (1824-1891) of Lowell and Daniel, Jr. (1822-1917) of Lawrence did. It could be said in part that both married into their later interest in the White Mountains. The former married Caroline Norcross of Lowell, the daughter of Nicholas G. Norcross, a famed lumber baron from Maine and New Hampshire,

Parts I and II of this article appeared in APPALACHIA for December 1959 and June 1960.

whose part in this story is best explained by quoting from *The Merrimack River* by J. W. Meader, published in 1871.

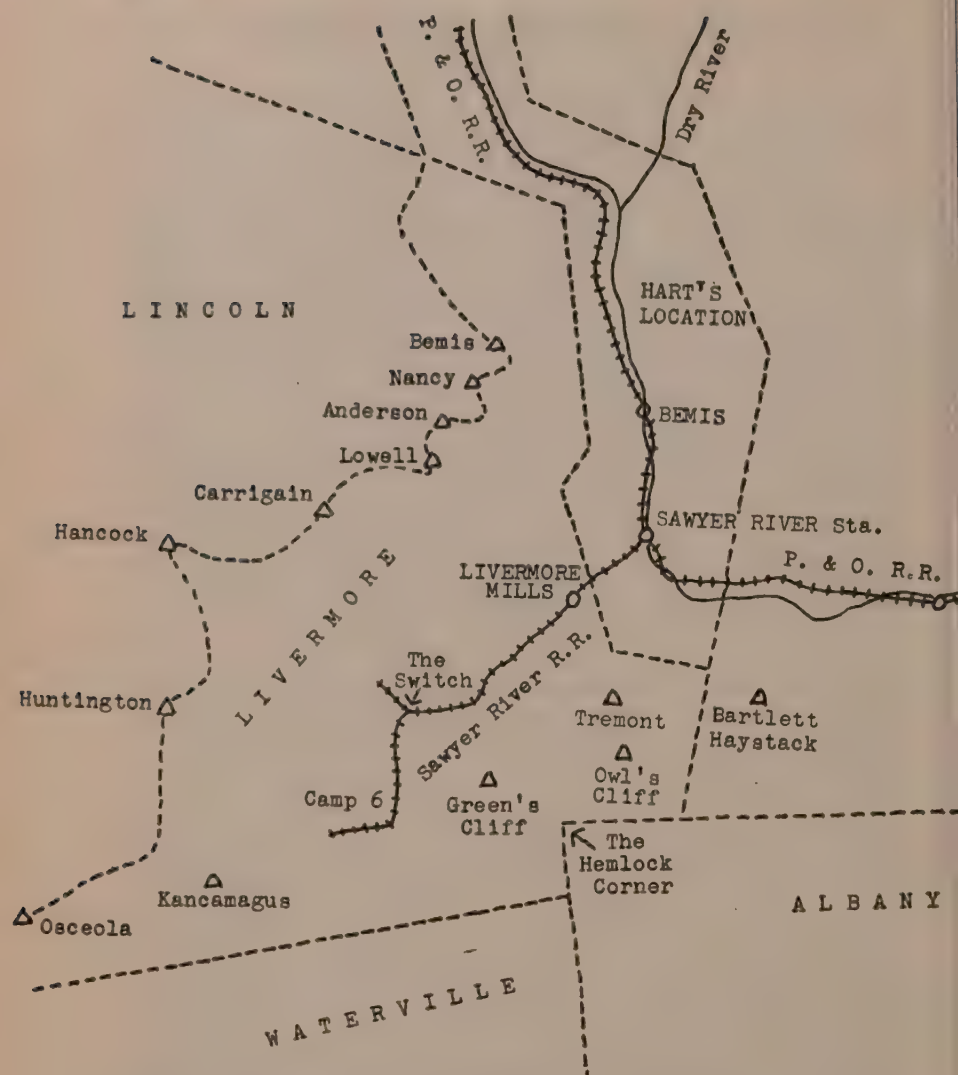
In 1844, Nicholas G. Norcross, who had already made himself rich and earned the title of "The New England Timber King" on the Penobscot, came to Lowell and established himself permanently on the Merrimack. . . . Mr. Norcross prefaced his operations by the outlay of more than one hundred thousand dollars in improving the channel and adapting it to his purposes. He blasted rocks and removed obstructions, bought land and provided for the stringing of booms for timber harbors, bought rights in some of the important falls, built two dams on the Pemigewasset at Woodstock, N. H., and purchased the Elkins Grant of eighty thousand acres of heavy timber adjoining the above town, Lincoln, and several others. He also bought a tract of forty thousand acres in the ungranted lands of New Hampshire and several other tracts. . . .

In 1845 Mr. Norcross built a large lumber mill at Lowell, where, with gangs of saws, upright and circular, he wrought out much of the lumber for the mills and dwellings of the city. This mill was twice destroyed by fire, but was soon rebuilt. He also built a large mill at Lawrence which was managed by his brother, J. W. Norcross. Mr. Norcross died in 1860, since which time the business has been conducted by I. W. Norcross, Charles W. Saunders, and N. W. Norcross . . . but the management of the lumber trade seems to have reverted to the original hands and is now conducted by Norcross and Saunders.

Charles W. Saunders had married into a family which had the rights to Elkins Grant, the heart of the Pemigewasset wilderness, and was in business with them rafting logs down the Merrimack from Woodstock, N. H.

Daniel Saunders, Jr., a graduate of Phillips Andover, Harvard and Harvard Law School, likewise married into a family with its heart and interests deeply bound up with New Hampshire history. In 1846 he married Mary Livermore, the daughter of the Hon. Edward St. Loe Livermore of Lowell and granddaughter of Samuel Livermore, one of the original settlers of Holderness. While Daniel, Jr., was well-known for his successful law practice in the Boston area, he was at all times, until his death at the age of 95, the brains and energy of the Sawyer River R.R. and the extensive lumber mills at Livermore, N. H. Like his father and brother Caleb (never a lumberman), he was active in civic affairs in Lawrence and served a term as mayor (1860). It was he who secured control of the rights to Elkins Grant from Norcross and Saunders through his brother in 1864 (see *Fed. Rep.*, 1st series, 441 *et seq.*).

The third member of the Saunders family to be active in the coming operations along the Sawyer River was Charles Gurley Saunders (1847-1918), the son of Daniel, Jr. Charles G. Saunders, also a resident of Lawrence, followed in his father's educational footsteps at Andover, Harvard and Harvard Law School, and then joined him in law practice with offices on State St., Boston.



Among his many later accomplishments, Charles G. was to be known as one of the great law experts of his time on Episcopal ecclesiastical matters.

On the shoulders of the first two Saunders, brothers Charles W. and Daniel, Jr., was to fall the labor and responsibility of the founding and the early years of the Sawyer River R.R. and its subsidiaries, the Grafton County Lumber Co. and the Livermore Mills of Livermore, N. H. But with the death of Charles W. in 1891 the fruitful years of these infant rail and lumber operations would be under the guidance of Daniel, with able advice and

assistance from his son, Charles G. With the death of both these in the short space of one year the active management would pass to other persons serving the family estate but not members of the family. Today there are no direct descendants of these Saunders.

Somehow the records of fact, fancy and folklore of the White Mountains have never put the Saunders of Livermore in their proper perspective. As Mt. Carrigain dominated the Sawyer River valley and the Pemigewasset wilderness, so did the Saunders and particularly Daniel stand above their contemporaries in the lumber history of that memorable period.

THE RAILROAD

Once the Saunders had control of the area and had selected a site for their operations beside the Sawyer River about two and a half miles above its confluence with the Saco in Hart's Location, there came a series of acts of incorporation. First was the founding in 1874 of the Grafton County Lumber Company. Chapter CXI of the New Hampshire Laws of 1875 gave the rights of incorporation for the Sawyer River R.R. to Daniel Saunders, Charles G. Saunders, Caleb Saunders and others. They were "authorized and empowered to locate, construct and maintain a railroad not exceeding six rods in width from some convenient point in Hart's Location westerly up the valley of the Sawyer River to some convenient point at the height of land dividing the waters between the Pemigewasset and the Sawyer Rivers".

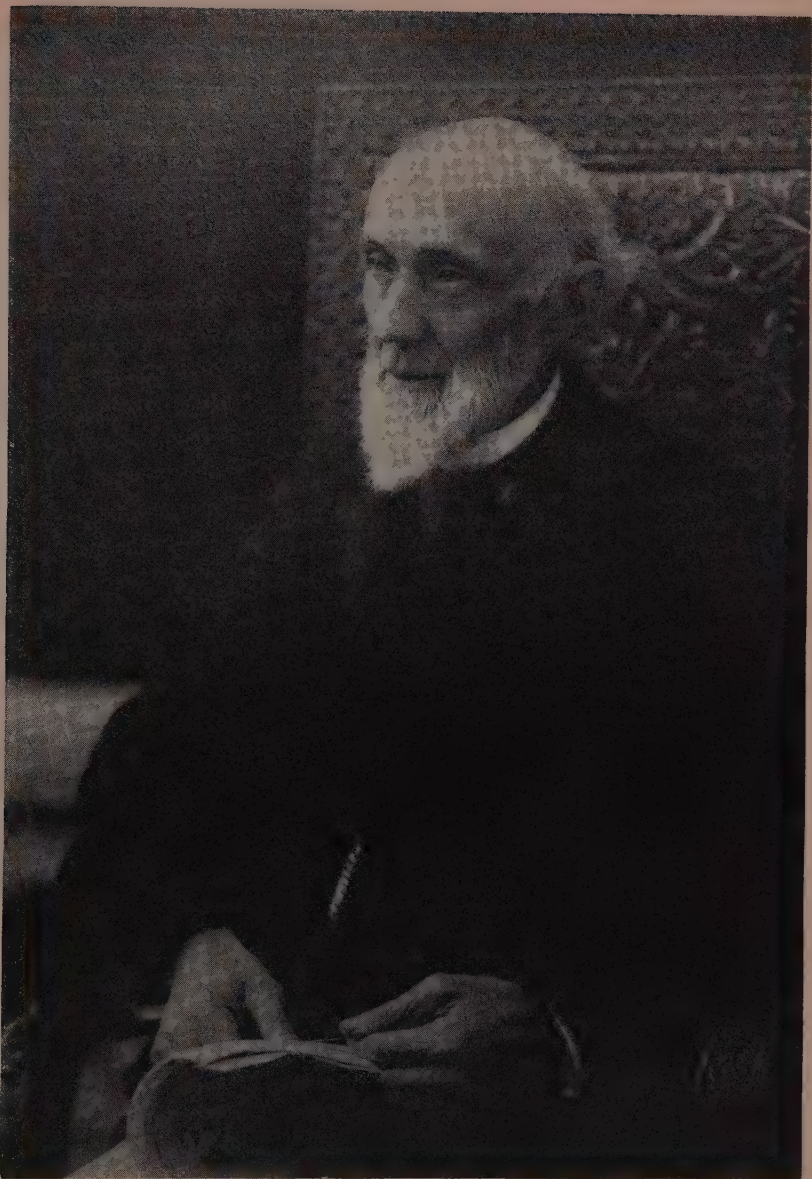
Laying a railroad into this steep and confined valley could not have been done until 1875, when the Portland & Ogdensburg (later Maine Central) R.R. was punched through Crawford Notch from the south, to provide a connection with the outside world. In 1877 the Saunders actually started laying rails for their line up Sawyer River, and by agreement with the Eastern R.R. (later the Boston & Maine) they leased three miles of relay rail and other track equipment. This was enough for connections and yards at Sawyer River Station and Livermore and the two miles in between. This agreement was supplemented in October 1880 by the further leasing of five miles of rail, switches, frogs, etc., from the Eastern R.R.—enough to reach as much as they needed of the wooden assets within their domain. Later, in 1907, after the Eastern was taken over by the Boston & Maine, the latter renegotiated these contracts to provide for increased rentals and additional replacement rails and equipment. As is indicated by papers in my files, these renegotiations were fraught with a good deal of dickering in which the Saunders' interests leaned heavily on the fact that they could divert line-haul lumber from the Boston & Maine to the Maine Central, if terms were not satisfactory. President James H. Hustis of the B. & M., in writing to several of his subordinate officers on this matter, once stated:

"In negotiating this contract the value of the Sawyer River Lumber Co. business to the Boston and Maine should be fully understood by the officer conducting the negotiations".

The Sawyer River R.R., all the way from its mainline connection on the Portland & Ogdensburg to its sequestered terminus on the eastern slope of Mt. Kancamagus, was never anything but a lumber railroad. While they now and then took riders on a riding car (flat car), no fares were collected, and no mail contract or express business distinguished this hill-country carrier. According to Clinton I. Nash of Boston, an officer for the Saunders' interests from 1902 until 1936, to whom I am indebted for much help on the history of this operation, the rail line operated on a friendly, informal basis. Over the 60 years of its lifetime only two steam engines honored the valley with their chugging and high-pitched whistles, the second coming only as a result of an incurable disaster to the first.

The old faithful iron horse of the railroad, named *C. W. Saunders*, was an 0-4-0 wood-burning switcher bought new in 1876 from the Portland Company. For 44 years *C. W.* clanked faithfully up and down from the woods to the sawmill with long loads of logs, which were then hauled, in the altered form of lumber, on mainline flat cars to connecting P. & O. sidetracks at Sawyer River Station. According to Mr. Nash, *C. W.* wandered off the track and onto the ground many times in the faithful performance of its duties, but never so badly that it didn't find its way back. Luck could not always be with *C. W.*, however, and in 1920 it wandered too far, right at Livermore, and found not only the ground but also the waters of the Sawyer River. *C. W.* had lived a long and honorable life. Enter the Number Two engine on the Sawyer River line, the "Baldwin".

The Baldwin, as far as logging engines were concerned, was a tramp. Its past has been well recorded in the files of the Railway Locomotive and Historical Society at Harvard Business School and was well known to such officials as Clinton Nash of the Saunders interests. While these records indicate that this engine was named *Peggy*, Mr. Nash has told me emphatically that it was never so known on the Sawyer River line. It was just the "Baldwin", so-named for its maker, the Baldwin Locomotive Works. Built in 1886, this 2-4-2 switcher had been fed a varied diet of wood and coal during its life and had worked hard for J. E. Henry on the Zealand line, the Blanchard & Twitchell Co. on the Success Pond R.R., and the many scattered tracks of the Publishers Paper Co. and the Conway Co. in several parts of the Eastern Slope country. It ran until the mill closed, was last in motion about 1936, and was sold by the U. S. Forest Service to the United Shoe Machinery Corporation in 1947 to get rid of an attractive nuisance in the dying Livermore location.



Courtesy of Clinton I. Nash

DANIEL SAUNDERS

"Old Mr. Saunders . . . appeared, standing straight and erect for all his ninety-one years, with his white beard, keen blue eyes and pink cheeks. He wore a spotless black broadcloth suit with a long coat, a white shirt and collar with a black necktie almost like a stock, and his trousers were tucked into high black cowhide boots."—Maurice M. Osborne, writing of Livermore in 1912 (*Appalachia* XXX, 64).



"C. W. SAUNDERS"

Courtesy of Clinton I. Nash



"THE BALDWIN"

Courtesy of Clinton I. Nash

Since the Saunders logged their territory with selective cutting methods, the length of the operating section of the tracks varied greatly from year to year. Engines and log trains ran up to and out from the upper camp, Camp 7, in three separate periods over the sixty-year operation, but there were times when C. W. and the Baldwin weren't within whistle-hearing for several years. Many of the two- or four-wheeled log trucks, called bunker cars, were equipped with antiquated link-and-pin couplers even in the later years of operation. Brakemen had to be careful of fingers and hands on the Sawyer River line! At Livermore there was a small engine house, generally used for engine repairs or in periods when the engine was not in use.

Except for a small stretch near the Maine Central tracks, the right of way followed the current automobile road, well above the river on the north side, from Sawyer River Station to Livermore, where it crossed over and followed the south bank of the Sawyer River all the way to The Switch (see map). At this point a spur track ran west about a mile toward Hancock Notch, while the main track continued southerly upriver to the Sawyer-Swift River height-of-land and curved west about a mile toward Mt. Kancamagus. Camp 6 was at this last bend, and Camp 7 was located at the end of the line. According to Mr. Nash and others associated with these operations, this was rugged operating country for any railroad man, rugged enough for the Baldwin to be equipped with double-flanged wheels. Singularly enough, except for the wreck of C. W. Saunders in 1920, there were no major rail accidents in 60 years of operations. Rail operations basically ceased in 1928, after disastrous floods in the fall of 1927 caused closing of the mill, although the Baldwin was steamed up and exercised several times between then and 1936. Officially the Sawyer River R.R. was finished with its dissolution by the New Hampshire Legislature in 1937.

THE TOWN OF LIVERMORE

Livermore was not an official entity in New Hampshire until 1876, but the name had already borne a long and honored association within the state. Holderness was granted in 1765 to John Wentworth and sixty-seven other Episcopalians, one of whom was Samuel Livermore. According to the noted guidebook editor and authority on the White Mountains, M. F. Sweetser, in *The White Mountains* (1876 *et seq.*):

Samuel Livermore came to Holderness in 1765 and lived in feudal state, owning half the township. He became Chief Justice of the Superior Court and U. S. Senator. His son Arthur was afterward Chief Justice of the highest state court.

Livermore Falls above Plymouth and Mt. Livermore in the

Squam Range already bore the family name at the time the Town of Livermore was so named by the New Hampshire Legislature for Mary Jane Livermore Saunders, wife of Daniel and granddaughter of Samuel Livermore. By Chapter V of the Acts of 1876, dated July 11, 1876, "the following tract of land situate in the county of Grafton" shall be a town by the name of Livermore (note carefully these bounds, as there were soon to be several varieties of mountain warfare over them):

Beginning at the south line of the Town of Bethlehem at the northeast corner of Franconia, thence running easterly following the south line of said Bethlehem to the easterly line of the county of Grafton, thence southerly following the easterly line of the county of Grafton to the northeasterly corner of the town of Waterville, thence westerly following the course of the northerly line of said Waterville to the easterly line of the town of Thornton, thence northerly following the easterly lines of the towns of Thornton, Lincoln, and Franconia, to the bound begun at.

This then was Livermore, the new part-time home of the Saunders of the lower Merrimack. Since there was no outside rail connection on the westerly, Pemigewasset side, their interests soon centered at the Livermore Mills site on the Saco side with its ensured railhead at Sawyer River Station on the P. & O. Roughly, the total area of Livermore at this time was 75,000 acres, with divisions of about 30,000 acres on the Sawyer (Saco) drainage and 45,000 acres on the Pemigewasset, and spill-overs into the Mad and Swift River watersheds in the south end of town. The Saunders settled in, stayed and ended on their original site. As we shall see, the lord of Zealand, J. E. Henry, was to take over the 45,000-acre Pemigewasset section. The negotiations and machinations, leading to the ultimate severance of this part of Livermore from the Saunders and its acquisition by Henry, both of them aided and abetted by that ardent, self-styled conservationist, George B. James of the New Hampshire Land Company, and by the Timber King of the Connecticut River, George Van Dyke, are much more involved than we have space for here.

Sufficient for our records is it to say that the Saunders interests, with their own good legal advice, disposed of their rights in that part of Livermore draining into the Pemigewasset to James and Company, in the late eighteen-eighties, while still holding rather large mortgages on the property. Later, in a wholesale series of complicated land-sales, first to Van Dyke and some of his ever-present lawyers, and ultimately from the latter to J. E. Henry and Sons Company, ownership passed to Henry in 1892 and 1893. Charles G. Saunders' mortgage on all these noted traders and lumber kings was finally discharged in 1899. Who took whom to what north country cleaner will not be known, but all parties did continue in business for a number of years and the

Saunders, over in their tight domain on the Sawyer River, outlasted James, Van Dyke and J. E. Henry.

We have spoken of Livermore in the broad sense, but what of the tiny hamlet and its inhabitants? While pictures accompanying this article show Main Street, Livermore, during the latter days of the Saunders operations (1929), today's visitor will find little evidence of any civilization in the same area. In fact, you might have trouble finding the spots where the pictures were taken, let alone any sign of a full-fledged township of 150 to 200 persons and a steam sawmill that supported 50-60 employees and upwards of 150 to 200 loggers in the hills beyond. The earliest written description of the town to be uncovered is that of Professor Charles E. Fay in *APPALACHIA*, Vol. II (July 1880), pp. 114-5, based on a paper read at the Crawford House on July 9, 1879:

He [the lumberman] has erected his rude village of unpainted cottages and his restless steam-mill, and up the rapidly ascending gorge where the Sawyer's River rushes as a foaming torrent, he even spurs the iron monster of the lowlands. I am informed by Mr. C. G. Saunders that the first mill of the Grafton Lumber Company was built here in 1876, and the railroad completed in the following autumn. In the meantime a second mill has been built, ten to twelve million feet of lumber cut, and the greater part of the Pemigewasset Forest incorporated as the township of Livermore, the only settlement of which is the rude hamlet at the mills. The mills themselves are situated on Sawyer's River, about two miles and a half from the Saco, and more than four hundred feet higher than the confluence of the two streams, and here is the present terminus of the railroad. A common road also leads hither, a wild, rough way through the forest,¹ apparently little traveled by carriages,—even more primitive than the railroad. About the mills the forest has been entirely cleared for the area of perhaps half a square mile, and part of this is already under cultivation.

Mary F. Butts, writing in the *New England Magazine* for February 1890 (Vol. 1, No. 6), speaks of Livermore on the occasion of a winter visit in 1889:

Onward we go through the crystal atmosphere, remarking on the marvelous stretches of white and green and blue, till suddenly we pull up with a shriek of the engine whistle at a sawmill. Once our feet are upon the earth, we see a boarding house,² a store, offices, and a row of houses bordering a steep street. Nearby is a small school-house where small French Canadians, Englishmen and so-called Americans are taking their first toddling steps toward citizenship.³

¹ And so it most certainly was from the close of World War II until the U. S. Forest Service built the present road on the former railroad right-of-way in the early fifties.

² With one of the finest boarding-house swimming-pools in the White Mountains.

³ Clinton Nash once advised me that the maximum number of children in the Livermore public school was about 20.

That life in the logging camps in the upper valleys was rugged in those days can be attested by further comments in the same article:

As we rise from the table, several loggers appear. . . . They are thinly clad, heavy clothing being an impediment to their work. Contrary to one's ideas of a woodsman, they do not appear robust; many of them are pale, hollow-checked and with sunken chests. Cases of consumption, we are told, often develop among them. The spicy mountain air cannot negative hot soda bread, greasy doughnuts, and the perennial bean thrust into exhausted stomachs. Not seldom a poor fellow is brought in from the woods with a gash in his foot and is condemned to "sit round" till it heals. No sign of book or newspaper is seen by which an uneasy wretch in such a plight might be amused and comforted.

An even more poignant reminder that this was indeed rugged living are the observations of the late George F. Morris, former Federal Court judge for the District of New Hampshire, in his privately-printed memoirs, *Yankee Jurist* (p. 90):

One particularly interesting discovery was made at another time when working in the Notch [Crawford]. Acting as attorney for the Maine Central Railroad, I assisted in laying out a sidetrack to a yard cleared for the storage and loading of logs to be used by a Berlin firm. In some thick bushes in the woods, not far from the Maine Central track, I discovered a single headstone with proper inscriptions marking a grave. In searching, I found only one headstone and my curiosity was very much aroused to know why apparently only one person had been buried in that out-of-the-way place. To satisfy this curiosity I later mentioned my discovery to Mr. Daniel Saunders, owner of the Livermore Mills, and asked him if he knew anything about the matter. I was told that many years before smallpox had broken out in his camp and that there had been about forty deaths and that all the bodies had been buried near where this marker was found and that the family of only one of the deceased persons had erected a headstone.

Livermore was never anything but a company-owned town and could live a full life only so long as its sawmills were whirling and buzzing. In addition to the wreck of the *C. W. Saunders*, there was another, very basic crisis in 1920. The sawmill burned down! Florence Morey of the Inn Unique recounts that for a time the rest of the small hamlet was threatened, enough so that she and her family went up by horse and team and helped the Saunders women evacuate their personal things and valuables from the Saunders mansion in Livermore to safer quarters at Notchland. Wind and manpower saved the day with the loss of only the mill.

All hands and the financial brains of the company put a new mill back to keep Livermore running a few more years, until the heavy fall rains and floods of November 1927 proved to be the disaster that was bigger than Livermore. With the rushing

waters that spelled ruin throughout northern New England went a good part of the railroad bed and some bridges of the Sawyer River R.R. Though the Baldwin puttered about the mill and yard for a year or two in shunting moves, and even strangers tried to fire her up from a cold start for a ride around the yard in the middle thirties, the mill closed for good in 1928. Representatives of the Saunders Estate, however, did sell some pulp off their lands between that time and the date of the official sale of the Saunders tracts to the United States Forest Service in 1936, which marked the end of any real living in Livermore. Joe Platt, who had worked in the woods and as a caretaker for the Saunders, and Bill MacDonald, another longtime Saunders hand, were the last two inhabitants in this dying, remote community, the former being the last to leave, in 1949.

The epitaph to the Town of Livermore was written in Chapter 247 of the Laws of New Hampshire for 1951. Section Two of that act reads in part: "That the town of Livermore is hereby dissolved as a body corporate and politic".

The original Saunders mansion and its outlying barn still stand, now the property of Mr. Nash. Like the headstone once discovered by George F. Morris at the entrance to the valley, it is a silent reminder of all the glory and living that once was Livermore. Nature is quietly and efficiently covering up the rest.

BORDER BATTLES

The Saunders had not long been embarked on the start of their infant sawmill and township in the primeval Livermore forests before they were up to their necks in writs and briefs. Daniel and his son would soon have the opportunity to prove what good lawyers they really were.

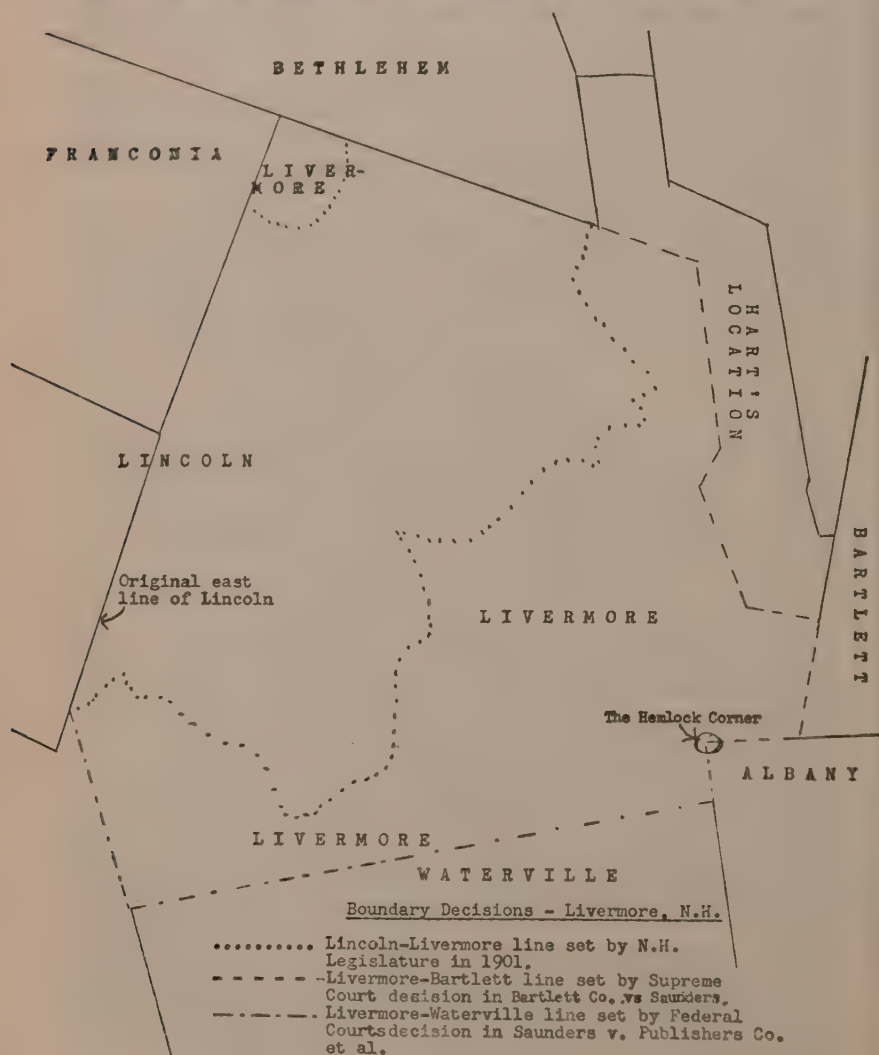
Livermore just wasn't in existence when the first dispute with the Bartlett Land & Lumber Company, holders of large tracts of forest to the east and southeast of the (then) Elkins Grant, started contesting the Saunders' right in their jointly abutting land with a suit in the Federal courts in New Hampshire in November 1875. This action went all the way to the Supreme Court of the United States for a written decision in April 1881.

As background to this case and following ones involving land rights on the southerly boundary of Livermore, it is worth noting that much of this vast territory in the heart of the White Mountains was State wildland until the middle eighteen-hundreds. At that time, through a series of vaguely described grants from State-appointed commissioners or State officers, these large tracts were deeded to private owners for what would be paltry sums by present standards. In addition, such land surveys as had been made at the time of these transactions were most primitive. The

late George F. Morris aptly describes in *Yankee Jurist* this survey problem, as he had to deal with it as a lawyer:

There had previously been two lines of survey made over the sides of certain mountains in the White Mountain area, and at no point did these lines coincide, while at many places they were widely apart. Between these two lines there was much valuable wood and timber. The question in dispute was which of the lines marked the true ownership.

In the case of the Bartlett Land & Lumber Co. *vs.* Saunders, as indicated on the sketch with this article, the boundary in question was the entire east line of Livermore where it adjoined



Hart's Location, Bartlett and Albany, and in particular the U-shaped section in the southeast corner of Livermore. The U.S. Supreme Court in its decision firmly supported the stand of the Saunders that the bounds of Hart's Location were a fixed monument by which the easterly line of Elkins Grant was to be set, even though this line had never been located by a fixed, definite survey. One side of Livermore was now set, but it wasn't long before another battle flared up on the southern edge of town.

This scrap in South Livermore at first did not involve the Saunders. The owners at that time were that will-of-the-wisp friend of both the lumberman and the conservationist, George B. James, and his New Hampshire Land Co., in one corner, and the Winnipisogee Paper Co. of Franklin, N. H., in the other. The stakes were a strip of land, 299 rods wide and 8-9 miles long, along the south boundary of Livermore and the north one of Waterville. The controversy hinged on a so-called "Hemlock Corner" (the northwest corner) of Albany. Most of this strip was in the Swift River drainage of Albany and the Mad River drainage of Waterville, *but* it was rich and deep in tender spruce and fir and very much worth a scrap. The decision went to the Winnipisogee Company.

In 1895, the "Will-of-the-Wisp", who had since bought the Winnipisogee rights, deeded this area to Charles G. Saunders, but quiet reigned until 1908 when the Publishers Paper Co. came into the territory (they were James's friends, too) and tried to exercise their alleged rights in this disputed strip. Livermore was Saunders, and the Saunders were good lawyers who knew their law. Around Hemlock Corner swirled a real storm in the form of a Federal District Court action entitled, *Saunders vs. Publishers Paper Co. and the Conway Co.* The final decision was rendered five years later, and when the dust of this legal battle and its ensuing settlement had finally subsided, the Saunders were still the lords of Livermore with their lands as originally described. Any present or past map of this area shows that the southern boundary of Livermore is still set 299 rods south of the Hemlock Corner of Albany, N. H.

Two sides of Livermore had been established by the preceding disputes, but in between them came a series of events which settled the other bounds of the town in a far different and more complicated manner. The bounds in question were those embracing the Pemigewasset watershed, the property of J. E. Henry *et al.* and briefly alluded to earlier in this article. During the period from 1890 to 1900 there was a good deal of border warfare along the common boundary of Henry and the Saunders, the high ridge from Carrigain to Kancamagus. It is best described by the late George F. Morris in *Yankee Jurist*:

All of the east side was owned by Daniel Saunders, doing business under the name of Livermore Mills. The west side was all owned by J. E. Henry & Sons Co. Both parties were engaged in lumbering and manufacturing operations. The only inhabitants in the Town of Livermore were located on the east side of the range in a little hamlet called Livermore Mills. . . . The parties were in frequent dispute, each charging the other with trespass. Finally the Henry outfit brought suit against Saunders, and a sheriff was sent through the woods to the top of the mountain, where the outfit [Saunders] was operating, to arrest the whole crew of choppers, which he did and took them all back to Lincoln and locked them up. It was then that I was employed by Saunders. . . .

My first move was to meet Saunders at Plymouth, from where we went together to Lincoln to arrange bail for the release of the men and to insure their appearance at the next term of the Superior Court.

In preparation for the trial, Raymond B. Stevens and I went from Livermore Mills back onto the mountains to inspect the cutover territory.

We started near the base of Kancamagus and followed the line of the watershed northerly. At every place where we found that either party had cut across the line of the watershed we carefully counted the stumps, measuring their size and estimated the height of the cut trees by the height of those left standing. . . .

We found that both parties had in places cut across the line of ownership, but when we got over into the valley between Huntington and Hancock, where the best of the timber had stood, the Henry outfit had cleaned the valley far to the east of the dividing line. . . .

Submitting our figures to a surveyor of lumber of experience, it was found that Henry's trespasses far exceeded the amount in value to those of Saunders. The case never came to trial and was settled by the Henrys paying a considerable sum of money. Thus litigation greatly increased the bad feelings already existing between the parties and resulted in a legislative act authorizing the division of the towns. [Action in Grafton County Superior Court in May 1899 term and settled by court judgment in November 1903 term.]

Henry C. Waldo, general manager of the Franconia Paper Co. in Lincoln, in a paper entitled "Short History of Lincoln" read to the Conway Historical Society in June 1960, refers to this period before the legislative division of 1901 as one where "white heat" existed between the Saunders and the Henrys. One legend that I picked up in my work on these operations had the Henrys setting up a sufficient number of their voting adult males within the town bounds of Livermore on the Henry side of the watershed to be able to take over a Livermore town meeting in the period from 1898 to 1901 and thereby assume control of Livermore politically. This legend I have not been able to substantiate by any existing records, and it will have to continue as another of the yarns about the many border disputes between these two parties and the towns they controlled.

Several paragraphs later in *Yankee Jurist* Mr. Morris continues his story of the disputes:



A.M.C. Collection

LIVERMORE MILLS AND LOG POND



Photo from Warren Hale

LIVERMORE MILL No. 2



C. F. Belcher

MAIN STREET, LIVERMORE, IN 1928



Maurice M. Osborne

CLEAR CUTTING NEAR CARRIGAIN POND

September 1912

The existing feud between the owners of the town of Livermore and the difficulties arising over the assessment and collection of taxes became a matter of consideration before the state legislature (1901), resulting in the passage of an act by that body dividing the town. This act provided that all that part of the town of Livermore drained by the waters of the Pemigewasset River be set off and become a part of the town of Lincoln and the boundaries set off be surveyed and marked upon the ground, and that two commissioners be chosen to mark the boundaries.

Many persons with whom I have talked on this subject have wondered why maps of this area have left an island of Livermore, far removed from the rest of the town, way up at the head of the Little River valley between South Twin and Guyot mountains. Here is the answer from one of the two appointed commissioners, George F. Morris, then a lawyer practicing in Lisbon, N. H.:

The language of the act, as has been said, provided that all that part of the town of Livermore drained by the east branch of the Pemigewasset should be set off to the town of Lincoln. When we reached the Bethlehem line on South Twin Mountain we found a basin well timbered. The old line showed it a part of Livermore. The basin set off by itself would naturally have been in the town of Lincoln, but as it was not drained by any branch of the Pemigewasset River and was drained by the Little River, emptying into the Wild Ammonoosuc [actually, the Ammonoosuc] and eventually into the Connecticut, by act of the legislature it should remain a portion of the town of Livermore.

The question arose as to what to do with this tract . . . whether to ignore the language of the legislature and apportion the tract to Lincoln or to run a new line according to the language of the legislature, which would leave the basin in Livermore.⁴ This latter course was followed. The line which we ran followed the strict line of the watershed to the summit of Mt. Guyot. From there it ran along the line of Mt. Guyot and the Little River Mountains until it reached the old line between Livermore and Carroll. The basin thus enclosed remained a part of Livermore entirely disconnected from the main body of that town.

This concludes the explanation of the boundary dispute affecting the third (and remaining) side of Livermore. With Livermore officially dissolved as a township by the State Legislature in 1951, it is a matter of conjecture whether what was once officially known as Livermore will continue to appear as such on maps of this area. Considering the rich heritage that Livermore has left to the mountains it is to be hoped that the name *will* survive the dissolution of the town.

This chapter of the saga of the Sawyer River line ends with a

⁴At this time, post 1901, neither Henry nor Saunders probably cared, as George Van Dyke had cleaned out the available timber from the area. (See APPALACHIA, June 1960, pages 46-49.)

comment on the won-lost average of the Saunders in these disputes. Whether it was 3 and 0 or 2 and 1, one thing certain is that in two of the legal decisions they were awarded the larger territory, and in the Henry dispute the Saunders and their town officers in Livermore no longer had to face endless arguments, and even fights, with the J. E. Henry crowd from what Senator George E. Moses once called the "Grand Duchy of Lincoln".

SELECTIVE CUTTING OF TIMBER

Today it is easy to understand the forester's phrases of timber management or selective tree-cutting. It is by these methods that most logging and lumbering jobs are conducted here in the East today. Selective tree-cutting is one of the basic foundations upon which our national forests are administered. But "selective cutting" wasn't even a common phrase, let alone common practice, during the lifetime of the Sawyer River R.R. or the Saunders of Livermore. The methods of their day are best summed up in the phrase, "clear cut". Over the many years of tree slaughter in the White Mountains between 1880 and 1915 many persons have described "clear cut". The late Maurice M. Osborne, writing in the June 1951 APPALACHIA (p. 404) on "The Last of the Big Trees" had a clean-cut version of "clear cut":

The lumbering system employed by the Lincoln people at that time was first to cut every single tree and sapling, whether or not it was to be taken out of the woods. Then when the worthwhile trees were trimmed and topped, they could be rolled down to the nearest road below without being held up by any obstacles.

Not only the memories of Saunders employees and officers but also official records support the statement that the Saunders cut *three separate times* on the bulk of their 30,000-acre domain. Clinton Nash confirmed this to me but added regretfully that about 1920 the taxation policy of the State of New Hampshire discouraged conservative lumber practices to such an extent that the Saunders Estate clear-cut their last virgin area on the east slopes of Mt. Kancamagus. He added wistfully that by this time the Henry idea (clear-cut and get out) was right. It is interesting to note that this same area was described in a preliminary survey report of the Forest Service examiner Dean Martin *four years before* thus:

An uncut part is situated at the head of the Swift River on the east slopes of Mt. Kancamagus and Mt. Huntington. It consists for the most of virgin spruce and is reported to contain 8-10 million board.

Regardless of what method was used in 1920 to clean this area, it can be said that nowhere else in the White Mountains would

such a rich stand of timber have lasted untouched for 41 years in the hands of the clear-cut operators.

On the first cutting of their domain the Saunders had the Sawyer River R.R. carry off primarily virgin spruce with a mixture of hardwoods to a diameter of fourteen inches on the stump; on the second time around 25-30 years later, to a diameter of ten inches; and on the third one, another 25-30 years later, to a seven-to eight-inch diameter. It is interesting to note that these conservative practices, leaving a minimum of inflammable slash for lightning strikes and the like, so served fire prevention that no forest fire of any significance ever scarred the Sawyer River valley. Clear-cut wastes and toppings just weren't there in sufficient amount to favor the start of a fire or hasten its spread. This cannot be said for such proponents of clear-cut as J. E. Henry, whose wasteful trash spread disastrous, extensive fires in his kingdom in 1888, 1903 and 1907. Of further note on the timber management practices of the Saunders is the fact that further selective timber-cutting has been carried out by the White Mountain National Forest in the last few years right in the heart of the Sawyer River watershed, a fourth cutting in what was once the heartland of Daniel Saunders & Co. The bulk of the Pemigewasset kingdom of J. E. Henry, Parker Young Co., and now the U.S. Forest Service can claim only one clear-cut shearing for its owners in the same time.

For this record are selected but two of a number of plaudits handed out to the far-sighted cutting practices of the Saunders of Livermore during their lifetime. Alfred K. Chittenden in his exhaustive report, "Forest Conditions of Northern New Hampshire" (1904), previously referred to in Part I of this article (APPALACHIA, December 1959, pp. 518-519), had this to say:

The most conservative cutting in the White Mountains has been done by D. & C. G. Saunders in Livermore, who cut simply to supply their own mill. This has an output of only four million board feet per year. The Messrs. Saunders cut to a rough diameter of ten inches on the stump and have [1904] been over the same ground twice, having cut the first time to a limit of fourteen inches. It must be remembered, however, that no pulpwood is cut on this land.

The Chittenden report includes comparative pictures to indicate the difference between the results of practices conducted by Saunders and those of the many clear-cut exponents of that time.

An editorial appearing on page 65 of the February 1908 issue of *American Forests*, official journal of the American Forestry Association, speaks even more strongly:

The value of conservative logging has been repeatedly illustrated. Even before forestry was much talked of in this country, a few far-sighted lumbermen were logging conservatively. Notably among them is Mr. Daniel Saunders, in Livermore, New Hampshire. Mr. Saunders

has cut the same land over twice for spruce saw logs, and it is still in good condition, with a large amount of small spruce which will soon be merchantable. Only trees over about sixteen inches in diameter were cut the first time.⁵ The second time he cut down to about fourteen inches in diameter, and as he was able to cut trees that were considered as cull or of no value the first time he obtained a larger cut the second time. There is still a great deal of valuable timber on this cut-over land, and in a comparatively short time it will be ready for a third cut. And the value of stumpage is still increasing. This is a striking example of what careful, conservative logging and protection from fire can accomplish.

Forestry as a science, and conservative cutting as a forest practice, were in their infancy at the time of the preceding quotations. It is indeed remarkable that this operation, comparatively small by American standards of that day, should be so carefully singled out by the latter editorial. Daniel Saunders and his son, Charles G., dividing their time between a busy law practice in Massachusetts and their lumber interests in Livermore, nonetheless were forest giants.

THE END OF THE LINE

There is no better moment than now to place the Saunders of Sawyer River in their rightful niche in the White Mountain log and in the long story of American forestry. Nowhere in my research has there appeared any evidence that they ever asked for the limelight which has been given so easily to their contemporaries, the colorful and wasteful lumber barons, a limelight that acquires unwarranted splendor with the passing of time, records and memories. As a famous New Hampshire politician of those years was called "The Tall Pine of the Merrimack", so indeed should these modest residents of the Lower Merrimack valley be "The Sturdy Spruce of the Sawyer and Saco". That it was their way of life to live quietly, to be successfully different and to be apart from and ahead of the other lumbermen of this most ruthless period in American forest history, was our good fortune.

Of their example and far-sightedness the people of today and the future will be the residual beneficiaries. Nowhere in the White Mountain National Forest have "We the People" been left with a more verdant and useful valley than that of the 30,000-acre Sawyer River watershed in what was once Livermore, N. H. Here the Saunders interests of Lowell and Lawrence, Mass., exemplified the best of a full life for over sixty years, yet set a good pattern and left a rich legacy for future generations.

The Sawyer River R.R. was a big, little logging line. The biggest.

⁵ There seems to be some difference here between Chittenden's report and this editorial.

A TRIP TO THE ROSS LAKES CIRQUES OF THE WIND RIVER RANGE

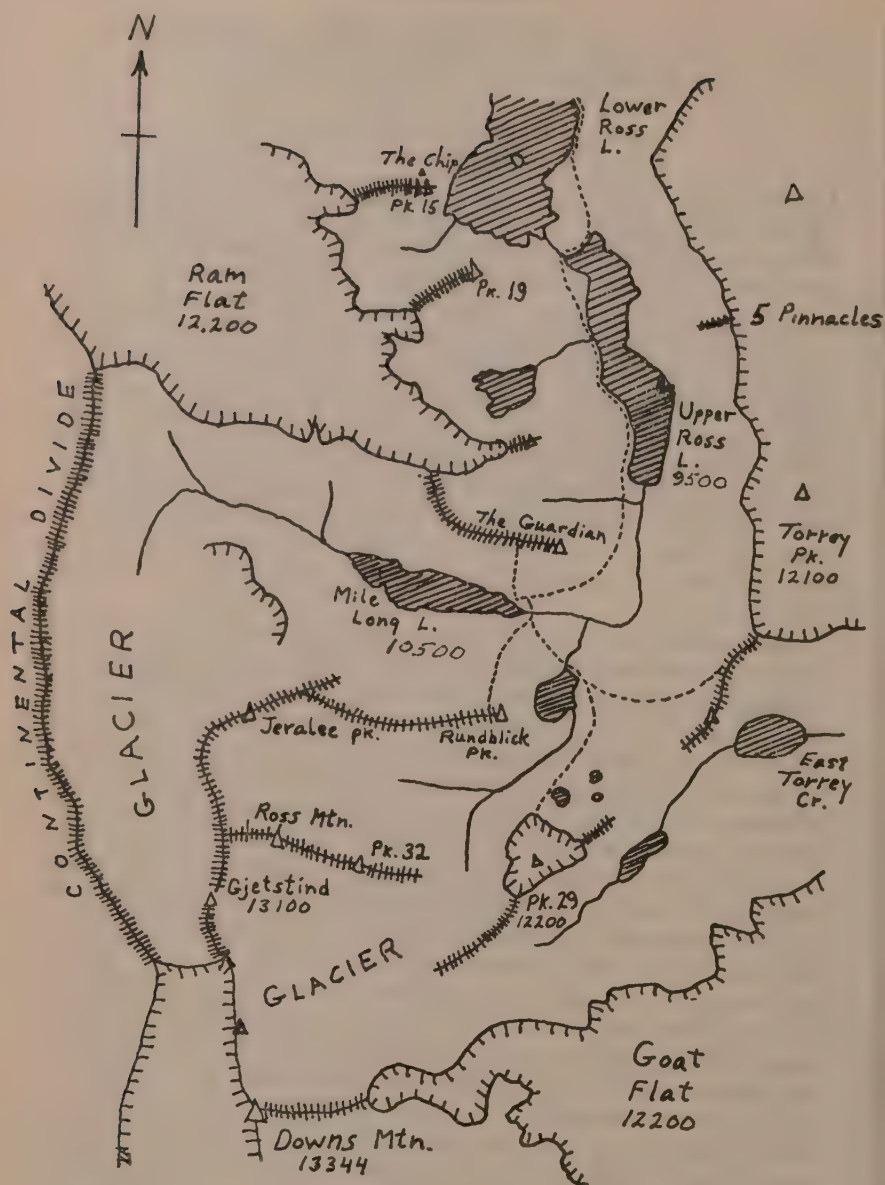
by BRIAN UNDERHILL

THE ROSS LAKES are near the northern end of the Wind River Range, at about the northern extreme of the glaciers and sharper peaks. On the east side of the Continental Divide, they lie about 13 miles due north of Gannett Peak. Around the lakes and their headwaters are several peaks of the order of 12,000 feet; since the area, like many in the Wind Rivers, is fairly hard to get into, most of these were unclimbed. So in August we decided to take a crack at them. Christopher Goetze, student at Harvard and breaker of the A.M.C. hut-to-hut record, and I had been climbing in Colorado during July, spending a week in the Sangre de Cristo Range and two weeks in the Needle Mountains near Silverton. This had put us into good condition for back-packing, living on camp food, and sitting out rainy weather; so we felt prepared to launch a two-week expedition to the Ross Lakes Cirques.

On August 5 we stopped off in Lander, bought thirty dollars' worth of dried food at the supermarket, and then continued on to camp at the foot of the trail, where the job of loading the packs began. We were glad to have learned in the Needles the art of leaving things behind; without it we should never have been able to bring our packs down to the ninety pounds that they were. The ruthless weeding out of unnecessary items was essential. One full-size rope was taken, along with lighter sling-rope and necessary iron. Two quarts of kerosene were considered sufficient for two weeks' cooking. Only essential clothing was taken. Finally we had omitted most of the things so optimistically planned for at the beginning of the summer.

A seven-mile jeep road leads from the highway to within a mile and a half of the lower (north) end of the lower Ross Lake. Since a sports car does not make a very good jeep, we walked this distance—a hot, dry march. The lake is a popular fishing spot and the path was well beaten. But trouble began at the lower lake, as there seemed to be no easy way to get around it. The terrain here consisted mainly of flat-topped peaks with sheer walls; and for a distance the west shore of the lake was a smooth cliff. The guidebook had suggested using a boat; not having brought one, we decided to build a raft. A very tippy raft it was, but it got us along the lake until our feet, hanging in the water, became numb. We then agreed that this was not an efficient way

BRIAN UNDERHILL, a member of the Club, is a student at the University of Colorado in Boulder.



0 1 2

Approximate Scale - miles

Stream

Edge of flat area

Ridge Crest

Plausible approach route

to travel after all, and carried our loads the rest of the way along the easier part of the west shore. This was not the best route, however; on the way back we found that the east shore was actually quite easy and had several game trails along it.

The upper Ross Lake, although shorter, lies in more rugged country than the lower lake. Either shore can be followed; on the east side you jump from one ten-foot boulder to another, and on the west side you bushwhack. The west shore seemed to be better for heavy loads. Halfway up the lake a formidable cliff plunged into the water, but the animals had found a series of ledges, ten feet above the water, which crossed the cliff. After this we got our first views of some of the peaks in the region—the sheer buttress overlooking the valley on the west which we later named “The Guardian”, and the high, square-walled Peak 29.¹ Camp was set up at the lower end of Mile Long Lake in a very beautiful and unspoiled spot. This seemed to be the most central location for the ascent of most of the peaks in the region. Although it had taken us about four days to reach this spot, with our improved knowledge of the area it would take much less another time.

Our main purpose the next day was to get up something with a view, so that we could see what the region was like. We started with the tower across the lake from camp, on the south side of the valley (Bonney's 26). Ledges and scree slopes took us up to the bottom of the steep rock, where we went to the right and found a very convenient ledge leading into a couloir. This led nearly to the top, a Grade II² climb. The peak did in fact have a fine view, and was duly named “Rundblick”. Of special interest was the view of the other peaks along the south side of the lake, which had looked so impressive from below. The next one to the west was only the end of a ridge of another peak; and when we got to it we found that the one beyond was only a cliff overlooking the valley. The next mountain (Bonney's 30) we called “Jerallee”, a name used on the 1:250,000 Army topographic map for Upper Ross Lake. We had a name ready for the third one, but it turned out to be a lake instead of a peak!

¹ Numbers assigned to peaks are those used by O. H. and L. G. Bonney in their guidebook, *Guide to the Wyoming Mountains* (Denver, 1960: Sage Books). There are some superfluous numbers in this guidebook, such as Peak 28, which does not exist on the ground. Apparently the aerial photographs did not represent the terrain with sufficient clearness.

² We used the following grading system, similar to that which appears in Bonney's guidebook (which is also reasonably close to the system Ortenburger uses in his Teton guide): Grade I, walk-ups; Grade II, scrambling, hands needed but not rope; Grade III, climbing requiring some skill, but which can be done quickly and easily. We did not use a rope on any of these. Grade IV, rope needed, occasional pitons for protection. Requires definite skill, although in the words of Ortenburger, “usually referred to . . . as an ‘enjoyable climb’”.

The tops of the ridges in this area are generally very flat, consisting of smooth rock where one can stride along with ease. The summit of Jeralee peak, for instance, is quite gradual and has a drop-off only on the west side. We circumvented this and crossed the glacier to the Continental Divide, which we followed to Ram Flat. The divide also is quite broad at this point; we found a small lake which to all appearance does not drain into either ocean. Even more amazing is Ram Flat itself; it is perfectly smooth and covered with short grass, with various rocks littered about. It is also just convex enough to prevent your seeing just where you are. We did see wildlife on this desolate place—an immense herd of mountain goats who were very curious as to what kind of strange beasts we were. I was just beginning to think that this was no place to be in a thunderstorm when one came up behind us; however, the goats were very useful in showing us the way down. We returned to camp via the Guardian, an 11,200-foot spur, giving it its name.

The next trip was to the most interesting peak of the region, Peak 29. It is a flat-topped, steep-walled mass at the head of the valley, on the divide between East and West Torrey Creeks. It is of the same height as Goat Flat and was probably once a part of this. It turned out to have an easy route of ascent, a Grade III scramble up the north ridge. Taking a leisurely pace, we arrived on the summit around noon and built a solid cairn on the highest scree mound. There are many other interesting routes on this mountain which we did not get a chance to try: the southwest ridge, a couloir on the west side, and a nice-looking chimney climb on the northeast. The rock seems to be good and most of the 360 degrees of face offer more than a thousand feet of climbing. On the way down we discovered an interesting thing—a cairn on a mound below ours with an inscription by Dave Dorman and M. E. Horn, Jr., who climbed the mountain on July 18. Evidently we were not the first party on the mountain. We wondered why they had not walked the few hundred feet to the higher summit. We thought that possibly the weather had been bad and they had not seen it, but when we met Dave Dorman afterwards in the Tetons he couldn't figure it out either.

Another trip we wanted to make was up Downs Mountain, the highest and farthest south of the group. It was climbed in 1906 by the survey party making the USGS map, and then a few times since. Downs is a scree heap, but it sits on a high plateau which is attainable by only a few routes. The best method was to get up onto the flat ridge next to Rundblick, and then follow it west and south. On the way we climbed "Ross Mountain" (Bonney's 31) and "Gjetetind" or "Goat Mountain" (Bonney's 12), a perfectly symmetrical scree-cone on the plateau north of Downs. It had a very good view back toward the rest of the peaks. On ar-



Christopher Goetze

PEAK 29 FROM SLOPES OF PEAK 25



Christopher Gietze

DOWN'S MOUNTAIN FROM GJETTEND

living at Downs, we found that it was not a populous mountain; the last party to climb it had been there in 1949. The standard route for climbing Downs is to come up over Goat Flat, a fairly long trip. The view from Downs toward Gannett and its neighbors, to the south, is very good, as the Divide between the two is very flat and low, so that no heights stand between.

After an unprecedented day of relaxation, due to general laziness, we started off for Torrey Peak, east of Upper Ross Lake. Among other things, we wanted to get some views of the sharp needles on the west side of the lakes, which we had not yet approached. Torrey has many routes, nearly all of them Grade III; we took the southwest ridge, which involved more climbing. Torrey also is a flat-topped plateau, with several strange-looking rock outcrops, of which we picked the highest for our cairn. From it we saw clearly the remaining peaks: Peak 19, Peak 15, and the set of pinnacles overhanging the lake (see map). We decided to do 19 the next day by coming down from Ram Flat, and 15 the day after by the same method. Peak 15 had four summits and looked like a very interesting climb. Both peaks appeared to offer difficulties above Grade III. After a leisurely lunch and descent we started preparations for the next day's rock climbing.

Sometime during the night we awoke to find our plans being doused by a continuous rainstorm. In the morning we were completely soaked in and there was no hope of climbing any mountains for awhile. All we could do was sit in the tent and eat a leisurely breakfast. Fortunately we had brought the fly for the tent, as we should have been thrown into chaos without it. As it was, we were quite dry and comfortable. Morning passed, then afternoon. We cooked supper also in the tent. The next morning I sleepily opened the tent door and was certain it was Christmas! Two inches of snow had fallen during the night and more was still coming down. After a round of exclamations, and a round of photographs taken outside, we retired into the tent and kept on eating. Fortunately we had brought an immense quantity of food. Once or twice during the day the sun appeared and we rushed out to dry things off before the next onslaught. Evening came and supper was again eaten in the tent. The snow continued on into the night, while we took turns stepping out and sweeping it off the tent fly, which was sagging under its weight. We decided that if climbing was impossible the next day, which was to be our last climbing day anyway, we would pack up and leave a day early. Sure enough, in the morning it was still snowing, so we threw everything into the sacks. Since all our equipment had been strewn around on the ground and was now well covered with snow, finding everything was quite a job. When we felt sure we had almost all, we took off down the valley. Need-

less to say, the sun came out as we got started and the weather was beautiful except for the wind clouds which covered the Divide. With the clouds, the coating of new snow in the crisp cold air, the mountains looked exactly like the Colorado Front Range in November.

This time we took the east shore of the upper lake, which was very slow going over country reminiscent of the boulders in King Ravine. The lower lake, however, was very much easier and we got back to the fishermen's domain by evening. After a relatively warm, comfortable night there, our last one, we walked out the jeep road and back to the car.

For the benefit of those making future trips, it might be said that there are a number of things left to do in the area. The set of pinnacles on the east side of the upper lake looks very interesting. There are five of them, similar in form to the Cinque Torri in the Dolomites, only on a much smaller scale. They seem to offer some very difficult routes due to their one-piece construction. They are accessible from the lake level by ascending a scree slope, or directly from the flat of Torrey Peak. The north end of this plateau can probably be reached from the lower lake. Peak 19 can probably be climbed from Ram Flat or via the cirque to the west of the upper lake. Peak 15 can be reached by going around the head of the lower lake and climbing up the stream to the south. It is necessary to start from the northwest corner of the upper lake and rise several hundred feet to avoid some boiler plate which plunges directly into the water. You will go under the very impressive north wall of Peak 19. Peak 15 also has a small chip, or flake, which has peeled back from the north side; this seems to be a fairly good climb in itself. In all the views we got of it, it showed very smooth sides. Then, of course, there are a number of routes on Peak 29. So several enjoyable climbs remain. All in all, we were very much impressed by the wildness and beauty of the region and, given better weather, hope some-time to return.

EQUIPMENT FOR WINTER CLIMBING AND CAMPING

by ROBERT L. COLLIN

IN SUMMER IT IS GENERALLY POSSIBLE, with very little thought given to equipment, to travel far and long in the White Mountains and suffer at most only minor discomfort. Such is not the case in winter, when even a short trip may involve deep snow, temperatures well below zero, and winds that challenge every step. Winter camping is an art which may be mastered with practice but which always demands careful attention to equipment. A sleepless night in the snow may exhaust a party to the point where they are incapable of climbing safely and must either abandon the climb or, worse, doggedly push on toward their objective unmindful of the slender gap between success and tragedy that faces an exhausted and perhaps demoralized party.

On an A.M.C. ski-touring trip¹ a number of years ago, I was impressed with the ability of the leader, with a light pack and a minimum of expensive equipment, to make himself at home in the winter woods and at the same time lead a group of six inexperienced people on a mountain tour. On subsequent trips I came to appreciate that he used each item with utmost efficiency. There was no waste and his equipment was based on careful consideration of the party, the route, and the possible weather conditions. My basic ideas on equipment were shaped on these ski-touring trips; they have subsequently been refined on snowshoe climbs by watching the sufferings of others, and myself, a process in which my climbing companions mistakenly believe I revel.

Any evaluation of winter equipment is fraught with the problem of separating objective judgment from personal bias and tradition. One trip is usually not enough to determine the worth of a piece of equipment; it must be used under all sorts of weather and terrain conditions before it can be relied on, and even then you are rarely sure that what you finally accept is the best available.

What follows is written primarily for those interested in a combination winter-climbing-and-camping trip in the White Mountains. Requirements for a short one-day climb are not so

ROBERT L. COLLIN is Chairman of the A.M.C. Equipment Committee. The present article is in some respects an elaboration on sections of that published in APPALACHIA for December 1959 (pp. 480-487), which should also be consulted.

¹ The ski-touring trips run by P. Starr Cressy introduced me to the field of winter camping and I am indebted to him for much of my knowledge of winter equipment and its use. He has also been kind enough to read a preliminary draft of this article and criticize it in detail.

stringent, but the same principles will apply to many of the items discussed. People vary in their equipment needs and I have tried not to dictate a specific outfit but instead have concentrated more on general principles and, where it has been necessary to be specific, I have discussed items which I personally have found to be satisfactory.

CLOTHING

On a climbing trip in winter there will be periods of intense exertion alternating with periods of minor activity, and clothing must be selected to suit such varying conditions. Unless clothes are adjustable and can be opened up or easily removed they will become damp from sweat and lose much of their insulating value for conserving heat when activity is low. For this reason a number of light layers is superior to a single layer. One should bear in mind that the body conserves heat when loss is excessive by decreasing the circulation to the extremities; the hands and feet will first feel the effects of cold. Cold hands and feet can often be prevented by increasing the insulation over the central part of the body.

The insulating value of clothing depends primarily on the amount of dead air which it entraps. The most insulation for a given weight comes from goose down and for this reason it is preferred in articles like sleeping-bags where much insulation is needed. However, goose down is expensive and is most efficiently used in a large single-layer garment. Wool is good, even when damp; it is relatively inexpensive and easy to incorporate into a number of light layers. Cotton loses practically all its insulating value when wet and hence is not suitable for winter insulation. Wool-like synthetics such as Orlon, with high abrasion resistance and strength, appear to offer good possibilities for clothing.

Windproof garments must be available for wear over the insulation and these should be made of tightly woven, water repellent cloth—not plastic or rubber-coated fabrics which prevent perspiration from escaping.

1. *Boots.*

Footwear poses the main problem for all climbers. There is no ideal footwear as yet but there are a number of acceptable combinations to choose from, each with attendant advantages and disadvantages. Boots are in constant contact with snow and are difficult to keep dry. Both boots and the insulation inside them may also become damp from perspiration. There is finally the purely structural problem of attaching boots firmly to skis, snowshoes or crampons.

Leather boots are the only satisfactory answer for ski touring

and technical ice climbing where a great amount of rigidity is necessary. Many beginners feel that they can use summer climbing boots and rely on extra socks to keep their feet warm in cold weather. This is fallacious, since the extra socks merely compress the feet and cut down circulation; the amount of dead-air space is increased very little and in fact may be decreased. If leather boots must be used, they should be larger than those worn in summer so that extra socks and innersoles may be worn and still leave plenty of room. Downhill-skiing boots have become so specialized in recent years that they are now suitable only for tow slopes. For touring, the boots should have a sole flexible enough to bend with your foot when you walk. What little insulation there is in leather is greatly reduced by impregnating the boot with oil or grease. A wax polish that covers only the surface should be used.

On long climbs, and especially on overnight trips away from a heated shelter, precautions must be taken to keep both boots and socks dry. Overboots made from water-repellent cloth will keep snow from wetting the boots and also from working down through the socks and between boots and socks. If the boots can be kept free from snow, then wetting of the socks from sweating will normally be a minor problem. If there is a tendency for feet to sweat excessively the socks can be kept perfectly dry by wearing a sock made from thin polyethylene (a plastic bag will do) next to the skin. The moisture collects in the plastic sock and the feet are constantly wet but the socks are perfectly dry. I have worn these on two-day climbs with great success, but on longer trips the constant wetting might lead to blisters and skin infections.

A major disadvantage of overboots is the difficulty of walking directly on snow in them. All overboots that I have seen have a slippery bottom surface that would be a nuisance around camp. Neither do they have the mechanical strength for the heavy going on rock and hard-packed snow or ice that is met with above timberline. In addition, both leather boots and overboots are expensive and my personal feeling is that they should be used only when the activity demands a rigid boot.

For snowshoe climbing the rigidity of leather boots is not needed. Barker boots with rubber bottoms and leather tops have been much used by winter climbers. They should be large enough to hold innersoles, felt or sheepskin, plus two or more pairs of wool socks. Because of their rubber bottoms and high tops, overboots are not needed, but perspiration collecting in the socks is still a problem.

The insulated rubber boots developed by the army during the Korean war, as well as their civilian imitations, are excellent for snowshoe climbing if used properly. The insulation is sealed

between rubber and cannot become wet from either inside or out, even if the boots are completely submerged in water. Since perspiration can escape only out the top, wool socks worn on long climbs will become saturated with moisture and blisters will develop easily. However, I find that if only light nylon socks are worn, taped to the underwear so that they stay in place, moisture accumulation is lessened and the smooth nylon surface protects the skin from blisters. For making camp, or in severe weather, a pair of wool socks can be put on for added insulation.

Because of their flexibility and softness these boots will not stand severe compression from crampon bindings or snowshoe straps. Any squeezing of the boot down on the foot is likely to result in blisters on the tops of the toes. With suitable bindings this need not occur. The large army insulated boots, now becoming scarce, are difficult to fit with crampons, but this can be done with a little effort. The smaller civilian version does not pose this problem.

2. *Underwear.*

Separate all-wool shirts and drawers are the only satisfactory winter underwear. That based on two thin layers, one cotton and one wool, as well as cotton underwear with a "three-dimensional weave", should be avoided, since cotton is much inferior to wool when damp. This is particularly important for clothing worn next to the skin.

String underwear, which is a fishnet weave of cotton, can be worn next to the skin under wool underwear. Whether it allows air circulation when you are moving and forms insulating pockets when you stop, as is intended, has not been proved to my satisfaction. Certainly, if heavy wool underwear is worn, the string underwear worn underneath it will do no harm and will at least eliminate the itchiness that some experience from wool.

Both goose down and Dacron fiber quilted underwear are available, the latter being much less expensive and nearly as good on a weight basis as the former. Both are much too warm for any but sedentary use. If a large enough size is obtained they can be slipped on over other clothes around camp when activity is low, but they are not nearly so satisfactory for this purpose as are down jackets and down pants. (See below.)

3. *Pants.*

Pants should provide wind protection and insulation, and should also be sturdy enough to stand rough use. The outer surface should be smooth and preferably water-repellent, so that snow will not easily be picked up. They must also be loose fitting, so they do not bind against the skin during the usual

climbing contortions; tight cotton pants like blue jeans are about the worse possible thing to wear for winter climbing.

Army surplus mountain pants made of two layers of heavy cloth are good but are difficult to find in any but a few sizes. Tightly woven wool or Orlon pants with a hard surface are good, but most downhill ski pants are much too flimsy and tight for climbing. A pair of wool pants tucked inside the boots or socks, with a light nylon outer pant worn as a covering and held over the outside of the boot with an elastic cuff, make a good combination. Down pants in various styles are useful for inactive periods and for wear inside the sleeping-bag, but they are much too warm to wear while climbing.

Some arrangement must be worked out to keep snow from working down inside the boot, since this is the best way, aside from stepping into a brook, to get wet feet. When pants that tuck inside socks or boots are worn a useful trick is to sew an extra cuff of water-repellent material on the pant leg that can be brought down over the outside of the boot and tied firmly. Sleeve legging arrangements can also be made rather easily, or they can be purchased in various styles.

4. *Shirts, sweaters and down jackets.*

All these should fit loosely in order not to compress the clothes worn underneath. The best shirts and sweaters are of wool and for most people two or three light layers will be sufficient. Shirt tails should be long enough not to pull out. A sweater with high neck is useful to wear in severe weather or during inactive periods. Down jackets provide excellent insulation. The best are made with few or no sewn-through seams.

5. *Parka.*

An outer windproof and water-repellent covering is necessary for the upper part of the body. It should be made of strong, lightweight, tightly-woven cloth and should not contain any insulation. An attached hood that can be drawn over the head and face, leaving only an opening for the eyes, is a necessity. Many otherwise good parkas have inadequate hoods. A parka should come well down over the hips and be loose fitting, especially around the shoulders. If you plan eventually to own a down jacket get the parka a size larger than you would ordinarily.

Suitable fabrics are cotton, nylon, or cotton-nylon mixtures known as pima. Nylon is light and strong but much more difficult to waterproof and keep water-repellent than cotton or pima.

While traveling on trails with low, snow-covered branches and while bushwhacking, by wearing a parka with the hood up you will prevent snow falling down your neck and back. For this use

it is convenient to have a full zipper opening down the front, so that the parka can be opened up for ventilation during periods of strenuous exertion. The danger of having the zipper ice up and jam in the open position should always be kept in mind and possibly it would be safer to carry two parkas, a very light one for snow protection and a heavier one without a zipper for severe weather. The army double-layer cotton-cloth parka with fur-trimmed hood gives excellent protection, but it is heavy. It cannot be opened down the front and hence is not too suitable for most climbing, but it is good in a cold wind.

An amazing amount of protection can be obtained from two parkas worn properly. A light parka is worn over wool shirts and on top of this is a loose sweater with a heavier parka on the outside. This is particularly effective around camp when the temperature is low and the wind high.

6. *Mittens.*

Gloves are useless for winter wear and only large, all-wool or down mittens, with full insulation up over the wrists, are adequate. An outer windproof and water-repellent shell should also be worn. Army surplus mittens are good, and the outer shells are also good if they can be found in a size large enough to hold double wool mittens. Extra mittens should be carried as replacements in case the ones being worn become damp. Down mittens are available and can be carried in your pack for wear when the temperature is low.

7. *Hat.*

A hat should be capable of protecting both the ears and the forehead. The wool balaclava helmet, long and loose fitting, is versatile. It can be worn as a hat or rolled down to cover the neck, face and forehead. A long, heavy wool scarf that can be wound around the face and neck is a useful accessory to a small hat, but a little practice is needed to use it effectively.

8. *Face-mask.*

Wind protection for the exposed portions of the face is a necessity above timberline, and although fur-trimmed parka hoods and balaclava helmets offer good protection in side winds, a face-mask may be necessary when fronting directly into a cold wind. There is probably no face-mask available that is comfortable to wear but the navy type sold in surplus stores is the best.

9. *Goggles.*

In winter the primary purpose of goggles is to protect the eyes from wind and driving snow. They should fit snugly around the eyes, especially along the lower edges, and both the upper edges and the sides should be perforated to prevent fogging from moisture condensation. Those who wear glasses will probably experience difficulties even with the large goggles especially designed for such use.

10. *Poncho.*

Rain can occur in winter and the best protection is a poncho made from light plastic-coated or rubber-coated nylon. It can also serve for emergency shelter when a tent is not carried. Ponchos made from sheet plastic become stiff and brittle at low temperatures.

Summary.

A description of a typical clothing outfit may be helpful to those with little experience. This is what I have evolved over the last few years and found to suit my needs fairly well. It is not the lightest for the amount of protection and it will doubtless be unsuited in certain particulars to some people. The main points in its favor are that it is inexpensive and that it works, at least for me.

If the temperature is below zero I usually put on everything for the first few minutes on the trail until I get warmed up by exercise. After a steady pace has developed I reduce to string shirt and pants, wool drawers, a light wool shirt, a light full-zippered parka with hood up, army mountain pants fashioned into knickers, nylon socks taped to the legs of my drawers, army insulated boots, nylon leggings that fasten just below my knees and come down over the top of the boots to my ankles, balaclava helmet, and one pair of wool mitts with outer shells.

In the pack I carry an extra pair of wool mitts, a pair of heavy wool socks, underwear shirts, wool shirt, sweater, goggles, and a heavy army parka with fur-trimmed hood. At the end of the day when I stop to make camp everything goes on again, except the goggles.

SLEEPING EQUIPMENT

There are two insulation problems that must be considered in selecting proper sleeping equipment: heat loss to the air and heat loss to the ground. The former is met by using a properly constructed sleeping-bag of sufficient thickness and the latter by sleeping on top of some fairly incompressible material that con-

tains a lot of dead-air space. Down is the best sleeping-bag filling, but it is easily compressible and will not offer much insulation underneath the body. Wool is good for the latter, but it is heavy. Certainly sweaters and shirts, if they are at hand, should be used under the sleeping-bag, but they will often be insufficient. Although air mattresses have become popular in recent years they do not offer much insulation for their weight, since the air space is not dead and tends to shift around with each movement of the sleeper. Foam plastics are much better for insulation from the snow.

1. *Sleeping-bag.*

A properly constructed, down-filled, mummy-style sleeping-bag is the only type suitable for winter camping. It is likely that some day synthetic fibers will replace goose down, but at the moment there is no good synthetic fiber bag available. When selecting a sleeping-bag for winter use you should keep in mind the following construction features:

a) The bag should cover head and shoulders, to prevent heat loss from the upper part of the body. Zippers or tapes should be arranged so that the bag can be drawn up to expose only the nose.

b) Any zipper should be protected by a large down-filled tube sewn inside the bag.

c) Pure, clean, goose down is the best filling, but the down-feather mixture of the army sleeping-bag does not add too much to the weight.

d) The bag itself should be made of light, finely woven cloth that will not let the down escape.

If the above principles are adhered to, the insulation will be determined by the thickness of the bag in use. At least three inches of insulation are needed for a comfortable night at the usual winter temperatures. The amount of dead-air space in a sleeping-bag that does not fit the body snugly can be increased by means of clothing; it is probably more efficient not to wear this but to bunch it up so as to fill the space between you and the bag. A thin down-filled inner bag will serve the same purpose and will let you use the clothes underneath the bag for protection from the snow. Alternatively, and probably better, a down jacket and either down pants or a small bag for the legs can be carried to fit inside the regular sleeping-bag.

On a long trip, more than two or three days, the insulation of the bag may be impaired by moisture given off by the body and absorbed by the down. On such trips an effort must be made to prevent moisture entering the insulation. This is best done by

not breathing into the bag and by not bringing damp clothes into the bag to dry at night. It is much better to dry wet clothes by suspending them near the top of a tent heated by a gasoline stove.

2. *Mattresses.*

The best solution to the problem of insulation from the ground is to rely on small fir boughs under the tent floor and extra shirts and sweaters under the sleeping-bag. When fir boughs are not available, in hardwood forests or above timberline, extra insulation must be carried.

Air mattresses suitable for backpacking are made of a light rubber- or neoprene-coated cloth. They come in various styles and sizes but only the lightest is needed. Plastic air mattresses are useless, because they become brittle in the cold and crack.

Sheets of the foam plastic "ensolite" give much better insulation for their weight than an air mattress and will stand more abuse. A pad the full length of the body is probably a waste when all that it really needed is insulation under pressure points at the shoulders, hips and feet. If you are fortunate enough to be able to sleep in one position, it should be possible to tape pads to the sleeping-bag in just the right places. I prefer to sleep on my side and I turn over frequently during the night. Last winter I experimented with two 5/16-inch-thick pads of ensolite, each 12 inches by 23 inches, sealed in polyethylene bags. Each time I turned over I would shift the pads so that they were in the correct places, a task facilitated by the slippery polyethylene and a pleasant diversion to help while away the long hours of winter darkness.

CLIMBING EQUIPMENT

1. *Snowshoes.*

The bearpaw type is the best for the White Mountains. It is maneuverable in bush and can be dug into a steep slope with a single kick. The beavertail design is practical on gentle terrain but is not so good as the bearpaw in thick woods and on steep climbs. The long Alaskan snowshoe is completely unsuited to the White Mountains. In any case the snowshoes should be flat, without turned-up toes.

Unbreakable-crust surfaces are frequently met with and the snowshoes should be fitted with steel claws on the bottom which project down about an inch. Claws can be fashioned from steel strap and wired to the snowshoes or half-crampons can be wired on. They should be mounted close under the sole of the boot, where most of the pressure will be located.

The snowshoe binding is of utmost importance. It should be built so the snowshoe flaps away from the heel while walking and it should be rigid enough to prevent sideways motion of the foot. All-leather bindings of one sort or another are commonly sold; all that I have seen are poor for climbing in rough terrain since they do not prevent sideways motion. The bindings on the army snowshoes are moderately well designed but the leather on the ones being sold in surplus stores in the Boston area is shoddy and should be replaced.

I know of no adequate snowshoe binding that is currently available but there is no reason why something suitable could not be constructed, using the metal hinge of the army snowshoe binding as a base. With soft boots, such as the army insulated rubber boots, the forward thrust of the foot cannot be controlled by tight straps across the toe, since the boot will not stand up to pressure in this area. A snug, wide toe-strap is necessary and forward motion is best prevented by a leather or light metal toe-cup against which the toe of the boot can press.

The heel-strap should come low down on the heel and away from the Achilles tendon. It must be held in this position by a simple arrangement which will allow the boot to be removed easily and quickly. Straps around the instep have been used for this purpose but they are neither very effective nor simple to use. A loop firmly attached to the boot, through which the heel-strap passes, is a good way to hold the strap in place and Barker boots can be obtained with this already sewn in. On boots made of rubber it may be possible to vulcanize loops on near the heel.

The webbing and frame of the snowshoe should be varnished at least once a season.

2. *Pack.*

For the loads of thirty or forty pounds usually carried on a winter overnight trip, a pack board or a pack with a built-in frame is superior to any other type. The frame rucksack is an old stand-by and fairly common. A well-constructed one, properly loaded, is suitable and the army frame rucksack can be used if nothing better is available. Rucksacks should be carefully loaded so that the weight is high and close to the body.

Excellent packs of the packboard type are on the market, consisting of a light metal frame, roughly rectangular in shape, with an attached bag. They can be used for heavy loads, since they give a good distribution of weight, and extra bags can be lashed on. The army plywood packboard and the Trapper Nelson pack frame, although heavier than metal frame packboards, are quite usable.

3. *Ice-axes and ski poles.*

In the usual winter climbing an ice-axe is seldom used to cut steps in ice but it is occasionally used to cut steps in crusted snow. Its main use is in the ascent of steep slopes, where it can be thrust into the snow ahead and used as a handhold. In descending or traversing slopes it can act as a third leg, and it can also be used for support in a heavy wind. For these purposes a long handle and a light head are best. The length depends on your height: the axe should reach from the floor to about three inches below your waist. A sling is a nuisance for most winter climbing.

Ski poles are preferred by many, due to the greater support they provide in soft snow. In any case it is wise to have at least one ice-axe in the party.

4. *Crampons.*

Crampons should be carried on all trips above timberline. There are many types to choose from, but only the lightest need be considered. They must fit snugly and there should be no movement between boot and crampon when the straps are tight. Ease in putting on and taking off crampons is important and the best binding for this purpose is a leather thong looped around metal hooks on the crampon and held with a quick-release clamp.

The Avcin adjustable crampon has recently come out in an improved version and appears to be just the thing for year-round use since it will fit both summer and winter boots. At its maximum extension it will even fit the army insulated boots. However, when the crampon is opened up as much as this the metal connection that holds the front and rear pieces together is not gripped firmly. It is a simple matter to fashion another connector, with holes drilled in the ends, to replace the slotted pieces that are supplied.

Army surplus crampons can be used, but some of these break easily and they should not be relied on for really heavy use.

5. *Maps.*

A good map should be carried and studied by each climber. I find maps of the U.S. Geological Survey easier to read and better than some of those in the *A.M.C. Guide*, even though they are often out of date with respect to trails and even roads. These should be marked in before the trip, using information given in the guidebook, supplements to the guidebook, and notes in APPALACHIA. The wide margins on these maps can be trimmed off and they can be folded and carried in a transparent plastic bag.

6. *Compass.*

A compass with a sighting device is the most useful type for winter travel and it will be easier to use if it is liquid-damped or if it has a locking device to damp the swing of the needle. The leader should keep his compass readily available and use it frequently to check position and direction of travel in unfamiliar country.

7. *Flashlight.*

Since both suppers and breakfasts are often prepared when the sun is down, a light is needed around camp. Although on a well-planned climb there is seldom any traveling after dark, emergencies may arise that will require such travel and for this lights must be available which will burn continuously through the hours of darkness in both cold and windy weather.

A hand-flashlight is of limited use in winter, since the batteries become cold and the voltage drops. The only satisfactory light is a headlamp, where the batteries are separate from the light and can be carried under the clothes and kept warm. A headlamp also leaves your hands free for cooking and eating.

Ordinary flashlight batteries cannot be used continuously because the voltage drops enough after about an hour's use to reduce markedly the light intensity. A rest period is then needed before the light will return to its normal brilliance. This is a situation that cannot be tolerated in an emergency and the Forest Service headlamp has been designed to get around it by an arrangement which allows you to switch back and forth between two pairs of batteries. A new "alkaline energizer" battery has been put out by Eveready which can be used on continuous drain for long periods, and, although three times as expensive as a regular flashlight battery, has definite possibilities for emergency use.

Both carbide lamps and candle lanterns may be used around camp, but they are of no use in a high wind and hence should not be relied on for emergency travel.

8. *Eating utensils.*

A plastic cup and tablespoon are all that are really necessary, but some people like to carry a plastic bowl in addition. Hard plastic is better than soft polyethylene, since food odors are not absorbed as readily; metal cups are difficult to use for drinking hot liquids.

COMMUNITY EQUIPMENT

The leader of a winter-climbing party has many responsibilities. One of these is to see that all necessary community equip-

ment is brought along and is in good working order. The one thing more demoralizing to an inexperienced party than finding, just as you are about to cook supper, that you have forgotten the stove is to have it leaking fuel so that halfway through the preparation of the meal it bursts into a fireball that burns the top off your tent.

1. *Tent.*

The main purpose of a tent on a winter trip is to keep out wind, snow and rain. If it also offers some insulation, so much the better. There are few good tents suitable for White Mountain conditions and these are expensive.

The tent must be light, made from a finely-woven wind-resistant and water-repellent fabric, and must be built so that it can be tightly closed up to prevent even the finest snow from entering. It should have a waterproof sewn-in floor and good ventilation, and it should be easy to erect under cold and windy conditions. If use above timberline is contemplated, it must be strong in both design and construction, so that it will stand firm in wind speeds even exceeding 100 mph. In addition there are other desirable features which one would like to see incorporated. With a high wind the constant flapping of the fabric can be annoying, and the tent should be designed to minimize this. A double-wall construction serves to provide insulation and results in a warmer tent, although the second wall adds to the weight and expense. A height sufficient to allow a person to stand up is convenient during cooking and dressing, but is not necessary for a short trip.

Large tents holding four people are a good size for winter, since weight per person can be minimized and cooking can be done more efficiently. However, the two-man tent is popular for general use and it is not so expensive for one person to buy or make. Two types of tent which have been proved by much experience in many mountain areas, including our own, are the Logan design with a square floor and center pole for a four-man tent, and the A-tent of which the two-man army mountain tent is an example. The army tent is well designed but it is heavier than is either necessary or desirable.

The weight of a tent is determined in part by the type of fabric that is used. There are a number of very tight, water-repellent cotton weaves which give excellent protection but which are quite heavy. For lightness of weight, nylon, Dacron and mixtures of these with cotton are the best fabrics. The cotton mixtures are not as strong as the pure nylon or Dacron and hence they must be used in heavier weights to give

the same strength. However, the cotton mixtures are much easier to waterproof. Even if nylon or Dacron is waterproofed once a season with a silicone repellent, the fabric will let rain through in a driving wind and to get good protection a fly should be used.

Tent construction is a field where more experimentation is needed. One approach that has not been tried by tent manufacturers, to my knowledge, is to make a double-wall tent with the outer tent made from strong nylon or Dacron but containing no floor. The inner tent can then be made from a very light cotton or rayon fabric but with a sewn-in floor and lower walls of some coated fabric. This would give good insulation because of the double-wall construction and at the same time any water that penetrated the outer layer would run down the inner one and off into the snow without penetrating. The big problem in a tent of this design would be anchoring the outer tent to the snow so that wind could not get underneath it. A tent based on these principles has been made and the reports are favorable, but much more testing is needed.

2. *Cooking equipment.*

A wood fire can be difficult to start and keep going in winter and it is much better for cooking to rely entirely on a stove burning gasoline or some similar fuel. The flame should be intense, so that food preparation is not dragged out, and although it is convenient to have an adjustable flame this is not necessary, since winter cooking should be kept simple. Stoves that burn Sterno or similar solid fuels are useless in winter because of their low rate of heat output.

Pumpless stoves such as the 71-L Primus are common but have the disadvantage that they tend to lose pressure in cold weather. There are a number of stoves with built-in pumps and these are better. The small G.I. stove which is occasionally seen in surplus stores is a good one and will operate on either unleaded (white) gasoline or VM&P naphtha. The latter is somewhat less volatile and hence safer to use. The fumes from ordinary leaded gasoline are poisonous and this should not be used in stoves.

Kerosene-burning stoves with pumps are also available in a number of styles, and although these require a little more care in operation than gasoline-burning stoves, they are quite good for winter use. Alcohol-burning stoves such as the Turm-Sport have definite possibilities for winter, since they give a hot flame with a relatively safe fuel that is not under pressure but which flows by gravity through a tube where it is preheated before entering the burner. Like any other stove this one should be protected from wind when being used. Light stoves burning butane in

throw-away containers are being manufactured in Europe, but until there is a local fuel distributor they are of little use to us.

Good stoves are complex instruments and must be understood and cared for if they are to function properly. The only pump stove I have used extensively is the G.I. stove and the hints which follow apply to this one in particular. The stove should first be pumped up and then carefully inspected for fuel leaks, especially around the pump handle. It is a common feature of the pumps on G.I. stoves to develop leaks after much use. A preliminary symptom of this is when the pump handle, after being released in the IN position, comes out of its own accord. This is a sign that the check valve is not closing properly, and the bottom end of the pump handle should be taken apart and the small spring that holds the valve closed pulled out a bit, so that more pressure is exerted on the valve.

Once you have assured yourself that fuel is not leaking from the stove, the cup around the burner is filled with a little alcohol (carried in a small polyethylene bottle) and ignited. The fuel valve should be opened only after the burner is hot, otherwise a yellow flame mushrooms up. If the burner is hot enough the fuel will burn with an intense blue flame. The person operating the stove should practice at home until he can light it quickly and neatly in cold weather. The night before a trip the stove should also be lighted and tested for proper functioning by the person who is going to use it.

A deposit of carbon forms gradually in the burner and after a few seasons' use it builds up enough to restrict the flow of fuel. This deposit can be burned off by dismantling the burner and holding the blackened parts in a gas flame (kitchen stove). The process can be speeded up by alternately dipping the parts in dilute hydrochloric acid and holding them in the flame. The acid should be thoroughly washed off afterwards. The wire gauze inside the burner should also be cleaned in this way.

The army stove holds enough fuel for about two hours' use and this is ordinarily enough to prepare two meals for four to six people. However, it is wise to carry some extra fuel in an aluminum screw-cap container (or a polyethylene bottle used for this purpose only), especially if water must be obtained by melting snow.

Two aluminum pots of two-quart size, with at least one cover, are all that is needed to cook meals for four to six people. A good nesting set is the army mountain cook kit sold in surplus stores. A light aluminum ladle is useful to have around for dispensing stew and hot drink.

3. *Repair kit.*

The make-up of a repair kit should depend on the equipment carried by the party. The leader must think over what will be taken by his party and try to foresee the breakdowns. A great deal can be done with nylon cord, wire and adhesive tape; a jack-knife, a screwdriver and a small pair of pliers are sufficient tools. The obvious statement that it is much easier to repair equipment at home than in the middle of a blizzard must be emphasized. Snowshoes are great trouble-makers and they should be checked carefully just before every trip. Heel-straps often break with little preliminary notice and the repair kit should include straps slotted at the ends so that they can be attached to the snowshoe as replacements without delaying the climb.

4. *First-aid kit.*

In case of serious accident or illness the primary concern will be to prevent shock by keeping the patient warm and comfortable and to remove him to civilization. For these purposes little that can be carried in a first-aid kit will be useful. For broken bones, splints can be fashioned from ice-axes and ski poles; bandages can be made from shirts and sweaters. There should be provisions for treating both cuts and small burns.

5. *Toboggans.*

In certain parts of the White Mountains toboggans can be used for hauling packs very efficiently. The Pemigewasset area is a good example, where the trails that follow old logging-railroad beds are wide, flat and level. Toboggans are hard to handle on steep or side-sloping trails, especially if there is an unbreakable crust. The common wooden toboggan is much too heavy and possesses too much friction to be of any use. Small plastic toboggans that will hold a two-man load are best. They can be pulled by one person while the second goes ahead to break trail and lend a hand on the steep places.

Food

The preparation of meals in winter is a tedious and uncomfortable job. However, hot nourishing food is necessary, for keeping up morale if for no other reason, and its preparation should be thought out with care before the trip. Appetites vary from one person to the next; some can get through a weekend on little more than cocoa and canned fruit, while others require more than they would at home. On longer trips appetites usually increase from day to day. In any case the rule to follow is "utmost

simplicity". Nothing should be attempted in the cooking line more complicated than boiling water or warming up a stew. Dehydrated food that requires prolonged soaking, and most do, should be avoided, since soaking in winter means that a fire must be kept going for the entire soaking period. This is a time-consuming nuisance.

1. *Lunch.*

On most climbs the burden on the leader is greatly reduced if each person prepares and carries his own lunch. In cold weather lunch stops must be limited to short periods and the food should be of a type that can be eaten quickly. Three general rules should be followed:

a) Food which is apt to freeze, and this includes bread, fresh fruit and eggs, should not be carried unless it can be kept warm until eaten.

b) No food preparation should be required on the trail, and the food should even be capable of being eaten on the move.

c) The lunch should be carried where it can be readily reached, such as in a pocket of the pack or at least near the top. Part of the lunch could even be carried in a pants pocket where it would be available for munching during the day.

Items which can be recommended are dried bread of any kind—such as toast, crackers, hardtack, etc.,—cheese, butter, peanut butter, jam, hard candy, cookies, chocolate, and such concentrated mixtures as mince meat or fruit cake.

2. *Supper and breakfast.*

For a two-day trip canned meat and canned fruit may be carried if the extra weight of the cans does not cause too much hardship. For more prolonged trips the canned articles can be eliminated and pre-cooked hamburger or meat-bars taken. Bacon or ham are good items for breakfast, but they should be cooked at home before the trip and packed in plastic bags or aluminum foil. In cold weather a high-fat diet can be tolerated and fat will provide energy-supplying food in concentrated form. Salt should be included, since much is lost through the skin with strenuous activity.

A typical supper menu for four might be:

soup (1 pkg.); stew made of hamburger, pre-cooked (1 lb.²), pea soup (1 pkg.), dehydrated potato (4 oz.), butter (2 oz.), salt and pepper; tea bags; sugar (5 oz.); cookies and chocolate (8 oz.).

This is on the skimpy side and if heavy eaters are along the amount of hamburg and potato can be increased.

A good breakfast is necessary if an active day is to follow. Stewed prunes or apricots are a start, followed by oatmeal to which has been added salt, butter and, just before serving, pre-cooked bacon. This can be eaten with a generous serving of brown sugar and either evaporated milk (kept inside a sleeping-bag overnight to prevent freezing) or powdered milk (either mixed with water or added to the oatmeal while it is cooking). A typical breakfast food list for four is as follows:

prunes (4 oz.), oatmeal (6 oz.), pre-cooked bacon (1 lb.²), brown sugar (6 oz.), butter (2 oz.), sugar (5 oz.), coffee (1 oz.), evaporated milk (small can) or dry milk, salt.

As much liquid as time and appetite allow should be swallowed at breakfast. This is best taken in the form of tea, coffee or hot milk, but sugared warm water will do nearly as well.

Both the above meals can be cooked on a mountain cook-kit with one stove. If more than six people it is better to break up into more than one cooking group. Also, if water is to be made from snow, it might even be worthwhile to carry an extra stove in the cooking group, to speed up meal preparation.

To prevent the pot from scorching when you melt snow, start off with just a little in the bottom and once this has melted add a little more. If too much snow is put in at once the water already present will be absorbed by the snow and an air space will form at the bottom of the pot and act as an insulator. When this happens the temperature of the pot bottom rises high enough to give the snow a burnt taste which is often objectionable.

EQUIPMENT SOURCES

Many items of clothing, such as wool socks, underwear, shirts, mittens, etc., can be obtained locally at war surplus stores or large department stores. War surplus stores are also a local source of snowshoes, stoves, compasses and many small items.

For the more expensive items, such as sleeping-bags, down jackets and tents, one should try local sporting-goods stores or go farther afield. Peter Limmer (Intervale, N. H.) carries many fine items of European manufacture. The A.M.C. Equipment Committee maintains a catalog file in the Clubhouse consisting of catalogs from most of the major mountaineering equipment manufacturers and suppliers throughout the world.

In this country there are several outstanding sources of general winter-climbing equipment. Gerry (Ward, Colorado), Holubar

² Weight before cooking.

(1215 Grandview Ave., Boulder, Colorado) and Trailwise (1615 University Ave., Berkeley 3, Calif.) all engage in the manufacture of many basic articles and sell items made by others as well. They also are a good source of supply for fabrics, thread and other items needed by those who make their own equipment. Eddie Bauer (417 E. Pine, Seattle 22, Washington) specializes in down articles. All these places are run by mountaineers, give excellent mail-order service and stand behind their equipment. Catalogs are available where detailed descriptions and prices are given.

LINES WRITTEN IN EARLY SPRING

On receiving the Club's monthly *Bulletin*

By a Townie

The Club's activities in the spring
Are enough to make a Sherpa sing.
Skiing is over on Beacon Hill,
And the schuss down Joy Street (what a thrill!).

Now we begin with a dandy lark
To the Wildlife Sanctum in Franklin Park;
Or get the tired muscles in key
By a night at the Pops with the A.M.C.

Then it's off to the great Outdoors
Where the cataract of the Ponk'poag roars.
Flashing my card at the MDC cop
I floorboard through to the dizzy top.

The outdoor spirit has got me roamin',
I'll go to the cook-out on Boston Common
After running the rapids on Charles Street flood,
For the call of the wild is in my blood.

There's clearing trail in Dorchester
With just a cup of wine and her;
Is that to be preferred, I worry,
To climbing rocks in the Quincy quarry,

The Natural Hist. of Mt. Auburn Cem.,
Or the open house for the brand new mem.?
These are the choices that I must pair
With arrowhead hunting in Scollay Square.

But the grandest trip, a safari stalk
Dwarfing the famous Revere Beach Walk,
Is the backpack up, my ice-axe wielding,
To the top of the *Herald-Traveler* Building.

ROGER G. SMITH

(*With apologies to the late W. Wordsworth*)

VARIOUS NOTES

ALPINA

Dhaulagiri (8172 m., 26,795 ft.), almost the last 8000er to remain unconquered and one which had resisted the attempts of several expeditions, was climbed twice this spring by members of a (mostly) Swiss expedition led by Max Eiselin. The first ascent, by three Swiss, one Austrian and two Nepalese Sherpas, took place on May 13, and the second, by two other Swiss, on May 23, after a wait of ten days for good weather. The expedition used the method new to Himalayan climbing of dispensing with porters and, instead, transporting equipment and supplies, as well as the climbers themselves, by airplane to the first two camps, at 5200 m. and 5600 m. respectively.¹ After making 43 flights (25 to the lower and 18 to the higher camp), carrying up 50 persons and nearly 8 tons of material, the plane cracked up on May 5 when making a forced landing on a high snow plateau at 5000 m. Pilot and mechanic, the only persons aboard at the time, were uninjured, but suffered greatly from cold and lack of food before they managed to make their way out to a settlement eight days later.

After the loss of the plane the climbers themselves had to serve as coolies. Acclimatization had been effected by ascents of smaller nearby peaks, instead of by the walk in to the base, as with other expeditions, and was so successful that no oxygen was used in the final assaults. Another innovation was the sending of weekly reports by shortwave radio to Berne, Switzerland, where they were duly and clearly received.

Among the members of the expedition was Norman Dyhrenfurth, U.S.A., who served as photographer.

Annapurna II (7937 m., 26,041 ft.), the second highest peak in the Annapurna chain, was climbed on May 17 for the first time by three members (two British, one Sherpa) of a combined British-Indian-Nepalese expedition led by Lt. Col. James O. M. Roberts, the British military attaché in Katmandu. The final climb from the highest camp entailed the traverse of a narrow and exposed ridge two miles long, followed by nearly 2500 feet of difficult mixed climbing over steep snow and rock.

On May 18 two of the Sherpa porters belonging to the expedition climbed Annapurna IV (24,688 ft., first ascended in 1955) on their own initiative, and on May 19 this climb was repeated by four other expedition members, including one Sherpa.

Other Himalayan Climbs. Himal Chuli (25,801 ft.) on May 24 and 25, by a Japanese expedition, two members reaching the summit on each of the days.

¹ This will now set a new altitude record for such landings by plane, the former one having been at the height of 16,200 feet, on Mt. Sanford in Alaska. (See APPALACHIA for December 1959, pp. 535-7.)

Ganesh Himal (24,300 ft., first climbed by Lambert and Kogan in 1956) on May 31, by a one-man expedition consisting of the Englishman P. J. Wallace and two Sherpas. This is said to be the altitude record for such a team.

Trisul II (6690 m., 21,909 ft.) on June 5, and Trisul III (6170 m., 20,274 ft.) on June 7, by a Yugoslavian expedition, the first to be sent out by that nation. (Trisul I, 23,360 ft., was first climbed in 1907, by T. G. Longstaff.)

Disteghil Sar I (25,868 ft.), the highest peak in the Karakoram west of K2, on June 9, by an Austrian expedition, which left Gilgit only on May 6. The claim is made that no peak of such altitude has ever been climbed in so short a time.

Trivor (25,330 ft.) in the Karakoram, on August 17, by an Anglo-American expedition led by Wilfrid Noyce.

Everest from the North? Fittingly enough, the most dramatic news from the Himalaya concerns Everest. An Indian expedition of twenty men, including nine officers of the armed forces, set out in the spring to climb the mountain from the south (the route of the first ascent). At 28,300 feet, however, late in May, the assault party was obliged to turn back because of bad weather.

Meanwhile, the Chinese, getting wind of this attempt and determined no doubt to be the first Asiatics to climb the mountain, organized a huge expedition of 214 men and tackled the peak from the north (the route of the early attempts). For some weeks the race went on. Eventually the Indians retired and the Chinese claimed success, reporting that on May 24 three members of their expedition (two Chinese and one Tibetan) had reached the summit by this northern route, hitherto tried in vain.

The *Peking Review*, an English-language publication, gave a detailed account of the climb in its issues of June 7 and 14, and from these, through the medium of *Les Alpes*, we take the following. The Chinese reached the foot of the mountain on March 19 and set about a thoroughgoing program of training and acclimatization, using a minimum of oxygen. Finally, on May 17 a group of fourteen left the base camp at 5120 m. and on May 23 reached Camp VIII at 8300 m. At 9.30 the next morning the assault party, consisting of three Chinese and a Tibetan, started upward, while the other ten men descended to Camp VI, where they remained in support. The "second step", a rock escarpment about 100 feet high, required more than five hours of difficult climbing. As evening approached and the supply of oxygen diminished, it was decided that one of the Chinese, who had become extremely weak and was falling at almost every step, should remain where they then were, at 8700 m., and await the return of the others.

These continued the ascent, as night fell. At 8830 m. the oxygen was completely exhausted and progress became excessively painful; a long pause was necessary after each step. At 4.20 in the morning of May 25, after nineteen hours of toil, the party of three reached the summit. It was too dark to take any photographs. At 4.30 the descent was commenced and when, at daybreak, the party reached the 8700-meter level, they took pictures of their tracks leading up to the summit. Picking up

the man who had been left, they regained Camp VIII thirty-two hours after having left it.

We hear from England that "the Chinese ascent has caused a little polite and quietly expressed scepticism hereabouts, more or less on the lines of waiting to see some physical evidence of the success of the attempt". However, Mr. T. S. Blakeney, a prominent member of the Alpine Club, points out in a letter to the *London Times* that "it is not . . . correct to say . . . that the northern route up Everest had been declared unclimbable; I recall hearing Mallory, for one, say just the opposite, and I fancy most British climbers on that route considered that the completion of the ascent had become largely a matter of suitable weather". And, in fact, the Chinese have assigned as a chief reason for their success their scientific system of weather prognostication, which enabled them to time their assault for a period of excellent conditions. On the other hand, surprise was expressed in India that the Chinese should have succeeded on the north face in very good weather on the same day that the Indian expedition was beaten back on the south face by very bad weather. To which Max Eiselin, leader of the Swiss Dhaulagiri expedition, remarked that the weather could be completely different on the two sides of the mountain at any one time.—But could it be so on the summit?

Incidentally, the Chinese reported having found the body of a British mountaineer high on Everest, and having buried it. Sir John Hunt has stated that this was probably the body of Maurice Wilson, a British army officer who perished on the mountain in 1934 when trying to climb it alone.

Abinger Afghanistan Expedition 1960. Joyce Dunsheath, who recently spoke to the Club about her climbing in the Caucasus, is now off to Afghanistan. On July 7, 1960, she wrote from the ship *Estonia* of the Soviet Line as follows:

We were originally a party of four women but as we did not get the Everest Foundation grant for which we applied, the two younger members had to drop out for lack of funds. Eleanor Baillie, a fellow-member of the Ladies Alpine Club, and I then decided we would go anyway and get as high as we could.

Our object is the exploration of part of the Hindu Kush Range of Afghanistan and the climbing of Mir Samir (19,880 ft.) and/or other peaks. But the journey out is going to be fascinating. We are going on a Soviet Line boat to Leningrad, fly to Moscow, train to Tbilisi (Tiflis), spend three days in the capital of Georgia seeing the eastern end of the Caucasus, and on by train to Teheran. From Teheran we hope to climb Damavand, the highest mountain in Iran. We shall then proceed eastwards by local train to the Afghan frontier and then by local bus, for Afghanistan has no trains. I am assured that the bus goes on Mondays and Fridays (except Holy Days) to Kabul and Tuesdays and Thursdays to Hardaban! Let's hope we arrive on the right day!

We shall spend a few days in Kabul sorting the stores which should have arrived by sea and finding an English-speaking guide to go with a party. He, we hope, will arrange for porters and mules en route and will go with us to the foot of the mountains.

We have many other activities in mind besides climbing. We are collecting plants for Kew, carrying out research into the sweat glands and the common cold, testing a pocket pH meter, surveying the peaks with the aid of a photo-theodolite lent us by the R.G.S. and recording primitive music on a Minifon!—and of course taking color slides.

We expect to have six weeks in the mountains. If Tar Sauer proves practicable we shall make the ascent but if not there are many virgin peaks which are and we shall undoubtedly find something within our powers.

We shall get back to Kabul at the end of September and then wander through Swat, Hunza and Kashmir to New Delhi.

On September 18 Dr. Percy Dunsheath wrote:

My wife . . . has gone via Leningrad, Moscow, Teheran and Meshed to Kabul and is now completely out of touch up in the Hindu Kush.

She had a great welcome from climbing associates in Moscow and Tiflis and 60 miles outside Teheran she and her companion, Eleanor Baillie, made a successful but strenuous ascent of Damavand (18,900 ft.) unaccompanied! (Not bad for two women!) They had some adventures which apparently are more pleasant in retrospect than at the time.

My latest news is that they set out from Kabul with porters, etc. on 22 August but I don't expect to hear anything until they return to Kabul about the end of September. They are then repacking and setting off across Pakistan to Kashmir. I join them in Srinagar about 19 October and we laze in a houseboat a couple of weeks before proceeding to New Delhi where I have official engagements. We shall be back in London at the end of November.

Milton Mt. McKinley Range Expedition 1960. Our party was flown by Don Sheldon in his Super Cub to the north fork of the Eldridge Glacier, to the same spot where we had established our high camp in 1958. Camp was set up at about 6500 feet, some 20 miles east of Mt. McKinley, among the incredibly beautiful, gleaming white peaks. Since our primary objectives were glaciological, we spent most of our time and efforts on making glacial-movement studies and in studying the annual snow regime. We did manage to make several first ascents. On July 3 we climbed the two summits that lie east of Mt. Mather and are connected to it. The higher one we dubbed "Matherhorn". Our route led up a steep northern slope to the col between Mather and the first of the 11,500-foot peaks and along the corniced western ridge to the summit of the lower of the two. We continued over the top and down into the little plateau between the peaks and up the steep southwest face of the higher. The other first ascent was of the highest peak on the Eldridge-Muldrow divide, between the 10,200-foot peak we climbed two years ago and Black Glacier Peak, ascended on the same trip. We ascended the southwestern ridge and descended by traversing over the westerly neighbor of the peak before descending the southern face of this lower peak. The other members of the party were the Englishmen, Brian Wilson and David Atherton, and the Americans, Douglas Bingham, Thomas Bisbee, Nathaniel Goodhue and I.

ADAMS CARTER

Four-thousanders of the Alps. Fritz Wiessner of Stowe, Vermont, a member of the Club, this summer completed the ascent of all the 4000-meter peaks (about 70) of the Alps, being apparently the first American to do so. (They have been climbed by a number of Swiss, by a few French, Italians, Germans and Austrians, and by at least one Englishman.) His first was the Aiguille du Géant, climbed in 1920, and his last three, done this summer under bad conditions, were Mont Maudit, the Aiguille de Bionnassay, and the Punta Margherita of the Grandes Jorasses.

The rain in the Alps this last summer was unbelievable, the worst weather they have had for years. Up to the end of July the Matterhorn had been done only eight or nine times, including one ascent by the north face, which was easier than usual due to the great accumulation of snow on it. Fritz visited Chamonix three times, in the course of the summer, before finding weather sufficiently good for his climb of Mont Maudit, which included a traverse from the Vallot Hut over Mont Blanc, via the Col de la Brenva and a shoulder of Mont Blanc du Tacul to the Col du Midi, up the Aiguille du Midi, and so to Chamonix.

Miscellany. The phenomenal Italian climber Piero Ghiglione, whose exploits in the Andes in the summer of 1959 were mentioned in our last issue (p. 87), on January 25 made, with two companions, the first ascent of the direct west wall of Alexandra Peak (5098 m., about 16,800 ft.) in the Ruwenzori massif. (The climb was led by the young Carlo Mauri.) On the summit Ghiglione celebrated his 77th birthday. [On October 10 Dr. Ghiglione died from injuries received the previous day in an automobile accident on the Brenner road.]

The use of airplanes in Alpine rescues has now reached the point where a manifold system of signs, to be traced in the snow, has been devised, so that a party in need of help, or a ground party proceeding to the rescue, can communicate with a searching airplane. For instance, there are letters or other symbols meaning "We need medical help", "Need blood plasma", "Must bivouac", "Show us the direction", etc., for the former; and for the latter, "Mission accomplished", "Further search impossible", etc.

At the end of June a French pilot, taking off from Grenoble at 4 a.m., succeeded after two attempts in landing on the summit of Mont Blanc, two and one-half hours later. Leaving the summit, he was back at Grenoble in 50 minutes.

During the summer season of 1959 there were 123 accidents, 77 of them fatal, in the Swiss Alps and their foothills. This increase of 50% over the number of accidents in the 1958 season is said to be chargeable chiefly to the account of the foothill climbers, all too many of whom are inexperienced or ill-equipped. Of accidents in both the lower and higher regions a large proportion concerned young people under 20 years of age.

A party of six Russian climbers made a three-weeks visit to Great Britain in May, as guests of a group headed by Sir John Hunt. A correspondent in England writes: "The Russian visit to this country was

quite a success. They gave a talk, with two excellent films, at the Alpine Club, when there were exchanges of gifts and compliments in a fine humor. Eugene Gippenreuter made a crack about a Summit Meeting on the top of Napes Needle which was as neat a bit of jesting as one could wish—and this just after Geneva. The party was then entertained by various clubs . . . on the crags of North Wales, the Lake District, Glen Coe and Skye, during a three-week stay which was favored by exceptionally fine weather. I gather that the visitors created a very good impression as climbers and sportsmen, though the climbing on offer was of quite a different kind from that they were familiar with." It looks as though the British really did push things a bit far in this last direction, for the *London Times* reports that, while attempting an extremely difficult rock climb in the Snowdon district, as third man on the rope, the Russian Eugene Gippenreuter slipped and fell 30 feet. He was held by the two leaders but injured his head and had to be removed on a stretcher for hospital care. However, all came out well in the end.

ROCK CLIMBING

New Climbs on Cathedral Ledge. (a) The face to the left of 'Recompense' (APPALACHIA, June 1960, p. 95) is broken at half-height by a tree-covered ledge. A (probably) new climb was made here by R. Willmott and J. M. Turner on May 23, 1960, and was repeated independently a few weeks later by Earle Whipple and party. The route reaches the extreme right of the ledge by two groove pitches. Pitons were found in the first pitch, but not thereafter. Some aid was taken from a tree at the start of the second pitch. From the ledge the top was reached by two pitches slanting up to the right, the first being a slab and the second a groove. Because of the large number of cans and bottles found on the upper portion, the climb was named 'Refuse'.

(b) About 40 ft. right of 'Repentance' (APPALACHIA, Dec. 1958, p. 256) is a sister crack in the upper half of the cliff. This may be reached from directly below, and provides an interesting climb of medium 5th class. The first ascent was made on July 1, 1960, by R. Willmott and J. M. Turner, and the climb was named 'Remission'.

(1) 120 ft. Start about 30 ft. right of 'Repentance' in an awkward groove behind a tree. This is climbed until a move right can be made onto the face, which is followed to a stance beneath a wall containing two cracks.

(2) 90 ft. The left-hand crack is climbed, switching to the right after about 10 ft. The slabs above are followed to a stance about 10 ft. below a chimney.

(3) 90 ft. The chimney is difficult to reach and enter, but straightforward to follow and leads to a wide ledge on the left.

(4) The chimney above is deeper, and leads without difficulty to the top of the cliff.

J. M. TURNER

Climbing at Poke-O-Moonshine. Mt. Poke-O-Moonshine is situated on N.Y. Route 9, some three miles south of Keeseville. The main face, about 350 feet in height, overlooks a state campsite; about one-half mile south, and set back in the woods, is a steep slab 450 ft. high. Climbing started here in 1957 and has been developed by various members of the Canadian Mountain Club. The cliff has also been visited by parties from New York, Dartmouth and Pittsburgh. The descriptions of the climbs include numerical grades; because of the subjective nature of many climbing problems, these grades are only a rough indication of the difficulties to be expected. No attempt has been made to match the decimal precision that is popular in the Southwest. In general, free climbs are graded from 3 to 6, and direct-aid climbs from A1 to A3; the extremes of each grade are denoted by plus or minus signs.

Climbs on the Main Face

1. *'Paralysis'* (5+). Towards the right-hand end of the cliff, beyond a broken section with vegetation, is a shallow amphitheater. The climb starts from a massive block in the middle and follows a crack straight up for 150 ft. to a line of overhangs. There a long traverse is made to the right, across slabs and around two particularly exposed corners. The traverse leads to a ledge on which stand many perched blocks. The small overhang at the left is climbed, and the groove above is followed to the top. This climb is one of the most attractive on the cliff.

2. *'Neurosis'* (4+). The climb takes the broken rock, with vegetation, to the left of *'Paralysis'*. The first pitch is an obvious chimney narrowing to a crack beneath a tree ledge. (The ledge may be reached with less exertion by a traverse from the first stance of *'Worse than Real'*.) The climb continues up and to the right, mainly on steep slab. The exit is in a prominent dark cleft.

3. *'Worse than Real'* (5-). This climb starts 50 ft. left of *'Neurosis'*. A ledge with vegetation is traversed right, into a groove which overhangs slightly at the top. The crack above is climbed and a traverse right is made to a second crack, which overhangs alarmingly at the start. The climb continues directly upwards.

4. *'Bloody Mary'* (6). Left again is an area of smooth rock capped by a complex of overhangs, and beyond this is a fierce-looking groove, which the climb follows. There is a belay ledge 30 ft. up; the second pitch starts with a layback, followed by bridging to a small stance at 110 ft. The third pitch leads up to a comfortable stance. Above, the climb tends slightly to the right. This route is the most arduous on the cliff.

5. *'Positive Thinking'* (6-). 100 ft. left of the *'Bloody Mary'* is a clearing in the trees that grow at the foot of the rock. Above is a dark overhanging chimney; the climb reaches this in a direct line, via the face and cracks directly beneath. The first pitch is the crux, and the chimney itself is much easier than it looks.

6. *'The Half-Mile'* (5-). This follows an intricate line of weakness that bisects *'Positive Thinking'*. The start is about 100 ft. to the left, and twice it is necessary to climb up, across, and down to avoid spots where the traverse line has been omitted. After *'Positive Thinking'* is



J. M. Turner

POKE-O-MOONSHINE, THE MAIN FACE



J. M. Turner

POKE-O-MOONSHINE, THE SLAB



Charles S. Krug

THE CONNECTICUT ROVING TRAIL CREW, 1960

Charlie Krug, Shelton Hicock, Lud Fehrenbach, Jean MacKesson,
Marie Carden, Seymour Smith

(See page 268)

crossed, broken rock leads to a small forest. Above this is a block, up the center of which runs a thin crack leading to a birch tree; this is the hardest pitch of the climb. Easy slabs above the birch tree lead to the top. The climb as a whole is an excellent exercise in route-finding.

7. *'The F.M.'* (5+). The most obvious feature of the left-central portion of the cliff is a huge nose of rock near the top. About 100 ft. right of this, and about 50 ft. left of the start of the *'Half-Mile'*, is a wide, shallow depression running up the cliff. This is the line of the *'F.M.'* The first belay is a good ledge some 50 ft. up on the extreme right. The second pitch, the hardest of the climb, is mainly a traverse to the left (a sling left in place here is frequently used for aid). The third belay is a triangular ledge, up and to the left. (The Nose may be reached by a traverse from this point.) A steep ribbon of slab leads right, to a groove which is followed to the top. This climb is the most popular on the cliff, having had already about twenty ascents.

A variation starts from the foot of the final groove and follows a spectacular rising traverse to the right for about 200 ft. A slab beneath an overhang is crossed, and the overhang is then climbed via a double jam-crack. The *'A.M.'*, a line which reaches the traverse from directly below, is as yet unclimbed.

8. *'Psychosis'* (6— and A1). 200 ft. left of the Nose, and about 50 ft. above the ground, is a tree-covered ledge. From the middle rises a crack, which is laybacked strenuously to a small ledge. The crack above requires two stirrups. A slab then leads easily left and up to a stance beneath some overhangs. The final pitch crosses the red wall beneath the overhangs, and passes around a corner to easier ground on the right.

9. *'The Snake'* (3). From the left end of the tree-covered ledge rises a traverse line. The climb is easy, but quite exposed and well situated.

10. *'Discord'* (5+). 100 ft. left of the ledge is an obvious line, crossing *'The Snake'*. 60 ft. of scrambling lead to a face that is climbed on small holds to the foot of a layback crack. This is followed to a stance on *'The Snake'*. Above is a dark groove which is followed to the top.

Climbs on the Slab

11. *'Le Poisson'* (5— and A1). The most striking feature of the slab is a line of overhang curving across in the form of an arch. The climb starts beneath the highest point of the arch, and takes a crack that slants up right to a series of ledges. The highest of these is traversed right into an oblique groove, where direct aid is required.

12. *'The Arch'* (6—). The climb starts beneath the center of the arch and takes a direct line up to the overhang at the point where it is smallest. The central wall may be climbed at only one point, but above and below this variations are possible. The difficulty is very sustained up to the arch; above, easier rock leads up to the right.

13. *'Catharsis'* (5—). The climb lies on the area of slab to the left of the arch, and follows a diagonal line from left to right. The climb is extremely pleasant, and compares very favorably with the other slab climbs in the Northeast. There are countless variations to every pitch save the last one. A 130-ft. rope is recommended, although it is not essential.

Grade III Workshop. The Mountain Leadership Committee sponsors several workshops each year, in line with the various classifications. To cover the Grade III requirements, such a workshop was held on Provin Mountain, Agawam, on May 21-22. The purpose of the meeting was not so much to teach those participating as to provide a mutual exchange of information which would be of value to all of us. Invitations were sent to forty-nine organizations urging them to send representatives, with the restriction that these must be rope-leaders or others responsible for the climbing program of that organization. Eighteen responded to the invitations and they represented a fairly good cross-section of climbers in the East.

Subjects covered were equipment, basic-training methods, leader training, dynamic-belay practice, rescue and evacuation, and knots and rope-handling. Instructors came from the rock climbing groups in the Chapters and Boston. Thanks to Bill Putnam, the rock on Provin Mountain where his TV station is located had been recently cleared of vegetation and anything that might break loose. He also furnished quarters in the station for the participants and instructors. The program started on Saturday morning and the group was split into five sections. Each section spent two hours at a station and then moved on to the next in rotation. Each station covered one specific subject. Rescue and evacuation was held until Sunday, when a spectacular Tyrolean traverse was set up by Putnam and several brave characters were hauled across, lashed into stretchers.

In retrospect, probably the most valuable aspect of the meeting was the informal discussions that took place during meals and in the evening. Comparison of the methods used in training by the various groups brought out the fact that only two had a formal program at all, and of these two only one used static climbing in teaching beginners. All participants were very much interested in the A.M.C. training techniques and climbing practices. A dynamic-belay practice rig was set up by J. B. Gardner, who handled that part of the meeting. (A rock of approximately a man's weight, tied on a rope, was dropped free. The climber practiced arresting the fall.) Very few had ever seen such a machine and only one or two had ever had the opportunity to practice with one. J.B. and his equipment were busy all through the meeting.

In summary, we feel the meeting was successful in that it was the first opportunity for groups of this sort to exchange information and compare practices. If the participants take home with them and put into practice the programs and methods advocated at the meeting, safer and more proficient climbing will result. More time could have been devoted to rescue and evacuation training and a separate session is planned for this fall to cover this subject. We feel that this program is well worth repeating and plans call for an annual workshop of the kind.

Credit for long hours of hard work and the success of the project are due to the many rock climbers and others who proved themselves leaders on or off the rock.

IRVING MEREDITH, JR.

CLIMBING IN GENERAL

Mt. Whitney Marathon. On September 7 there took place the first annual "Mt. Whitney climb endurance test", sponsored by the Southern Inyo Chamber of Commerce of Lone Pine, California. The test consisted of climbing Mt. Whitney (14,496 ft.), the highest mountain in the United States outside of Alaska, from the public campground at Whitney Portals (elev. 8367 ft.), thirteen miles west of Lone Pine, where the ordinary trail up the mountain begins, and returning again to the Portals. Total distance 21.2 miles, total ascent 6129 feet, by a well-kept horse-trail, rough and rocky in places but involving no rock or snow climbing. Contestants were started at five-minute intervals and were checked at strategic points where aid stations with radios were established. The test was run as an amateur affair, with trophies for the first five places but no cash awards.

There were sixteen entrants, of whom ten finished. Winner was Calvin Hansen, a 25-year-old physical culturist at a Colorado Springs hotel, who made the summit in 2:37 hr. and the total trip in 4:09:22.5. He had won the Pikes Peak Marathon for the last three years, his best time there being 4:14 hr. On the run he carried a small vial of honey and lemon juice to provide quick energy.

Mont Albert on the Gaspé. Up until ten years ago the Shickshock Mountains were known to few. These mountains, the highest in southeastern Canada, extend from west to east in the heart of the Gaspé peninsula. They disappear at the very eastern tip of the peninsula, where a wall of limestone approximately four miles long juts out into the Gulf of St. Lawrence. It rises 700 feet at its highest point and varies between half a mile and a mile in width.

The Shickshock Mountains, from 3000 to 4300 feet in altitude, will be the high point for climbers visiting this northern region. The most accessible approach is by the newly-built road from Ste. Anne des Monts on the St. Lawrence River. Twenty-five miles along this road in the Gaspesian Park is Mont Albert.

It is a mountain well known to the alpinist and naturalist, and in many a book on botany its name is mentioned where alpine species are concerned. Only 200 miles north of Katahdin in Maine, it is the closest alpine area outside New England.

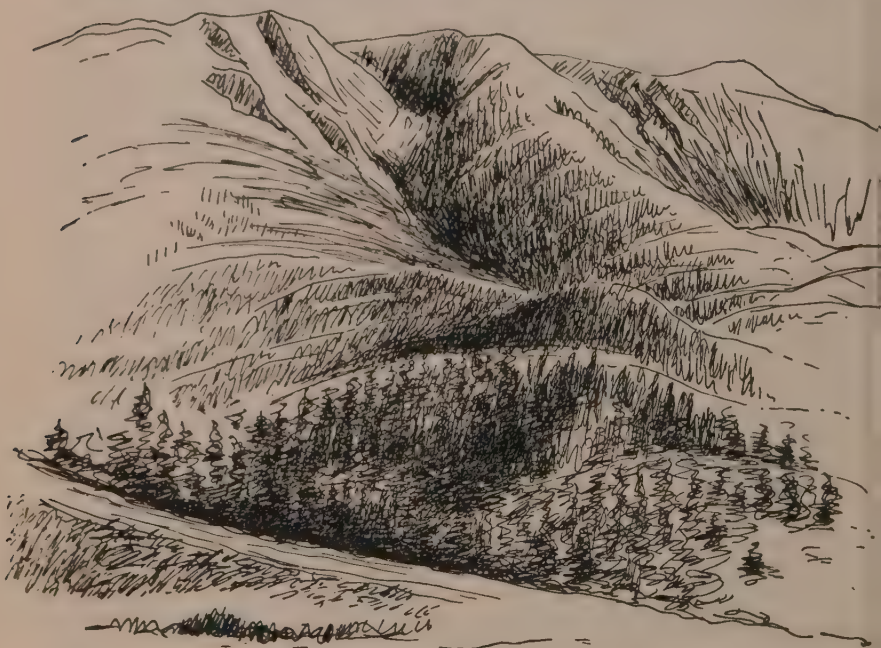
Not long after leaving the St. Lawrence River I found myself driving through wooded hills and approaching what looked in the distance like an impenetrable wall, the Shickshock Mountain Range. I reached Mont Albert by paralleling this range for some miles to the east. That evening I spent at the Canadian Park Inn (Gîte du Mont Albert), making plans to climb on the following day. This mountain, regardless of its mere 3669 feet, is impressive in grandeur. As I looked up through the pine forests, listening to the thunderous current of the Ste. Anne River in the background, my eyes met with a thinning of trees and then nothing but bare rock and large troughs filled with snow. This was the month of July.

Since the Shickshock Mountains are a part of the Gaspesian Park proper, regulations require having a guide. The following day, much to my dismay, I found that my guide, Gabriel, didn't speak a word

of English, while I didn't speak a word of French. Nevertheless we enjoyed each other's company through our common enthusiasm for climbing and nature.

The first several miles from the inn were by car, but then we left this modern convenience and poled our way in a flat-bottomed boat across the swift current of the Ste. Anne River. Once on the other side we started climbing and crossing mountain streams rushing to the river below. Just under timberline the trail led out of the woods to a small cabin, an overnight shelter for walkers, furnished with a wood stove and two bunkrooms.

Five hundred feet beyond we came out onto an immense plateau covering twelve square miles. Strewn with rocks carpeted with reindeer



lichen and mosses, this rolling tableland seemed to speak of its ageless past. Here in the late summer herds of woodland caribou arrive to feed on lichens, leaves and berries.

From the northern edge of the plateau my guide and I turned east towards the summit of Mont Albert, seen in my drawing at the far right. From here and from just about any point on the rim of the plateau one sees an endless array of mountaintops stretching to the far horizon. Five miles to the east are the Table-Top Mountains, nearly 4000 feet high and with thirty square miles of rolling arctic vegetation on their summits. Nearby is the Shickshocks' highest peak, Jacques Cartier (4300 ft.).

Leaving the summit of Mont Albert we walked to the easternmost part of the plateau and had our lunch on its sloping sides, looking down on the Ste. Anne River. Beside this river one could see the

Canadian Park Inn, our starting point, and its neighboring campgrounds.

Exploring in the afternoon along the outer edge of the sloping tableland we observed vast indentations filled with masses of snow. Everywhere over the top of this tableland were alpine gardens. Arctic pearlwort, trailing azalea, mountain heath, wild rosemary and red bearberry were just a few among many of the alpine plants.

We left this unique land. Some day I'll be back to renew my acquaintance. Until that time I shall always remember the sparse beauty of this arctic zone.

MARK T. FOWLER

Fort Kent to Katahdin. In early June of this year Tom Eckstrom and I entered the north woods of Maine with the objective of running a route, by trail or bushwhack, as far as we could in five days, toward Katahdin.

Beautiful Wheelock Lake was kicking up large waves and a recent rain had raised the shoreline, so that our expected route along the lake shore was inundated. The detour through a swampy area, amid alders and wellnigh impenetrable underbrush, was a tedious chore with our 80-pound packs.

The trails we had counted on were practically extinct, yet still discernible by the height of the new growth, which was lower than the older trees on either side. Most of our route was by compass and dead reckoning. In some swampy thickets the bushwhacking was difficult but, for the most part, giant yellow birch, oak and maple offered smoother going beneath their towering branches.

The area was plentifully supplied with signs of a dense native population of deer, moose, porcupine, wildcat and bear; but their keen eyes and ears, and our noisy approach, prevented our seeing much more than their signs. We did come across several bear lairs.

The flowers were beautiful, numerous, and in great variety. We saw many large white lady-slippers and a delicate purple lady-slipper, its blossom about the size of a small acorn.

Following an excellent blue-blazed township line we passed an abandoned sugar camp and arrived at Burnt Mill and the dirt east-west Carter Brook tote-road, which gave us easy going for several miles. (It would be difficult, yet passable, for a car, although especially eroded at the log bridge over Wallagrass Stream.) We explored a side-road which opened up on a grassy field containing a ruined lumber camp where at least 100 loggers must once have lived.

Turning north, we worked our way to McLean Lake and the summit of Mt. McLean. The mountain is completely covered with giant old trees and the top is jungle-like with thick vegetation, including ferns waist-high. This luxuriant growth surprised us, as the peak is north of latitude 47°. There is a summit view, presenting in panorama a vast green expanse of forest.

We continued, finally breaking out into civilization at the McKinley School near Allagash. We believe, from what we saw of this splendid forest, that the remaining distance from this point to Katahdin could be made in ten days, and hope to return to complete this mission.

CLARENCE E. LeBELL

Here and There on the AT. For two months this past summer, climbing alone, I covered four different sections of the Appalachian Trail, and numerous side-trails. Everything needed I carried in what averaged to be a forty-pound pack.

Starting at Katahdin in Maine, I tramped 150 miles along the AT, then hopped over to the White Mountains and climbed half the 4000-footers. The Green Mountains were my next stop, with Mt. Greylock in the Berkshires thrown in for good measure. Next I made a big jump down to the Blue Ridge Mountains in Virginia and walked through the Shenandoah National Park.

One morning in Maine I was rudely awakened by a large bull moose who walked right by the front of the lean-to. In Virginia the flying squirrels kept me up most of the night as they continually tried to get at my food. One night I shared a lean-to with a 70-year-old man who carried no sleeping-bag, axe or cooking utensils, but did think it necessary to have three hats, a casting rod and a pistol, to make sure no "panthers" got him. Other nights I crowded into eight-man lean-tos with as many as nineteen fellow walkers. A firetower watchman and his family gave me lunch and supper, then wanted me to stay overnight with them. Another family let me have the run of their camp for a night and insisted on feeding me the next day.

I've never spent a more enjoyable two months. I had loads of fun and at the same time learned a lot about nature, people and myself.

DAYTON C. GOUDIE

Grade I Leadership Workshop. The course of instruction for prospective Grade I leaders was held for the second time last June, using the A.M.C. Pinkham Notch Camp as a base of operations. Since all concerned were of the opinion that the first course was too short and hectic—due in part to extraordinary June weather conditions—it was decided to devote the better part of six days to this 1960 workshop.

Consequently we gathered at Pinkham at noon on Thursday, June 16, and got organized. That first afternoon we did no more than walk through the Old Jackson Road and on as far as Lowe's Bald Spot where, in fine clear weather, we had our first lesson in orientation and use of the Presidential Range map. One group returned via the Raymond Path, Huntington Ravine Trail and Tuckerman Trail, to get a good workout, while the others retraced their outward route. Lectures on planning trips and proper equipment were given in the evening. These were followed by slides of alpine flowers shown by Miriam Underhill and mountain safety movies.

Friday, to give potential leaders an idea for a trip for juniors, we rode up in the Wildcat gondolas. On the ridge Bill Putnam gave a lecture on the geologic history of the range, with a clear view of examples of glacial cirques and water-cut ravines right in front of his pupils. We then moved in two groups over the Wildcat Ridge Trail and down to Carter Notch Hut, where the black flies almost devoured the entire party. The descent to the Glen House was made via the Nineteen-Mile Brook Trail and Aqueduct Path quite literally in a cloud of smoke, most of it produced by Belcher and Swan puffing cigarettes. That evening we had lectures on first aid by Swampy Paris and on

mountain hygiene by Dr. Ben Ferris, and films on the use of map and compass were shown.

Saturday morning we were transported to the Ravine House after having been divided into three groups. The announced plan was to proceed up the Valley Way to the Scar Trail and then up to the Air Line, and the first two groups followed this plan. The third group was slow enough, however, to encounter a rainstorm before branching off toward the ridge and the decision was made to remain below timber at least as far as the Upper Bruin. Here the rain had stopped, but there were still clouds, and when we poked our heads out of timber and topped the Air Line ridge everyone got a fine lesson in the rapid transition between the shelter of timber and the lee of a ridge, on the one hand, and the windiness and cloudiness of the unprotected Knife Edge, on the other. Our only accident occurred here: Mrs. A. G. Dean stumbled and nicked a shin vein on a sharp rock. The first aiders pounced on her, brandishing compresses and adhesive tape, and checked the bleeding at once; she then made it into Madison Hut under her own power. (That night Dr. Ferris took a stitch in the cut and Mrs. Dean was able to continue without visible discomfort for the rest of the trip.)

Sunday we had ideal weather going over the Gulfside, in three groups again, but the cone of Washington went into the clouds shortly after we arrived there and so our pupils had another taste of the vagaries of above-treeline weather. At Lakes that evening after supper there were botanizing and geological trips around the lakes and on the Monroe flats. We were joined on the former by Justice William O. Douglas and the party traveling with him, and later Justice Douglas spoke to our entire party in the Lakes hut on the importance of keeping the mountains clean of such debris as beer cans and candy-bar wrappers. He said the mess in Tuckerman Ravine that afternoon had shocked him. (A few weeks later several hutmen got together on their days off and lugged 400 pounds of rusty cans out of the ravine. Perhaps some day the ski clubs can organize their own summer patrols and clear away the debris left by the spring skiers.)

Three routes of descent from Lakes were taken on Monday morning. One group went down over Glen Boulder, the second over Boott Spur, and the third—consisting of all who had never been on this trail—through Tuckerman Ravine. The rest of the afternoon was left free for the "pupils" to read the vast amount of literature which had been prepared especially for their use, and the evening was devoted to a free-wheeling discussion of the handling of emergencies, all of it based on actual experiences of the leaders. Once more this seemed to impress the "pupils" as much as anything we offered them.

Tuesday forenoon was taken up entirely by tests, most of them written, and by a discussion of the possible answers to the questions.

This year we were wonderfully fortunate in the number of persons who gave their time and services, in some cases at considerable sacrifice, and in the variety of skills and experience which they represented. Actually we had twenty instructors on either whole or part time. When one considers that we had thirty-five enrolled in the course this represented a teacher-pupil ratio of which any school might well be proud.

Once more we received the complete cooperation of the U.S. Forest

Service, which not only sent five men to serve on the staff of instructors but also enrolled three men in the course.

Those who served as instructors deserve the thanks of the Club, for in these workshops we are really beginning to give group leaders some experience that will lead eventually to safer and happier trips in the mountains. The staff included C. Francis Belcher, William L. Putnam, Robert J. Hogan, Irving Meredith Jr., Dr. Benjamin Ferris, L. Gordene Everett, J. Willcox Brown, Miriam Underhill, Swampy Paris, Samuel H. Goodhue and George T. Hamilton of the A.M.C.; Paul Doherty, conservation officer of the N.H. Fish and Game Commission; Bruce Cook and Robert Prescott of the Mt. Washington Observatory staff; and Gerald S. Wheeler, Leavitt Bowie, Henry Swan, Richard S. Goodrich and Edward Hastings of the U.S.F.S.

A large number of those taking the course were certified as Grade I leaders. My reward came later in the summer when I encountered perhaps a half-dozen of them on the range and every one of them was leading an intelligently planned, well-run trip.

BRADFORD F. SWAN

The Taming of Owl's Head. On July 23, a rather warm, hazy, humid day with a threat of showers, twenty-four of us started from the Kancamagus Highway bound for Owl's Head. This was the trip, mentioned in the December 1959 issue of APPALACHIA, which was to locate the true summit with the aid of mirrors and erect a cairn. The idea of mirrors was abandoned because of the weather, and the cairn was not built as we were not absolutely certain of the location of the true summit when we were there, but read on! By 8.15 a.m. we were all on the trail and at 12.30 we reached the slide after just one minor incident—the leader and a small group became lost for twenty minutes! At the slide the leader ordered three rugged walkers to proceed up the Lincoln Brook Trail for ten minutes, then to strike up the slope to the ridge, and rejoin us by coming south along it. The rest of us labored up the slide and reached the false summit in time for a rain shower and a late lunch. During lunch we had four visitors, two young men from the Portland Chapter and two misplaced fishermen. The Maine boys came out of the bush from the north and reported that our scouting group was waiting on what they considered the highest point. The fishermen had apparently seen us on the slide and just decided to follow. We sent them north along the ridge with the suggestion that since they were not yet on the right peak they had better go on and that the three scouts could suggest a route back to the trout. A few minutes later we then started along the ridge and thoroughly explored the terrain by peering under the thick bush, climbing trees and shouting "Are you higher than I am?", "Is there any other higher point?", "Do you think this is it?". And all the while no one could see anybody else because of the thick growth. In about 50 yards there was a high point off to the left, but in another 200 yards we came upon our advance guard and what seemed like the true summit. A small celebration took place as we inducted three new members into the select circle of 4000er climbers. Meanwhile our tree-climbers reported seeing a loftier peak to the north. Upon exploring this peak we agreed that here was the true summit. Congratulations were once again exchanged and back at

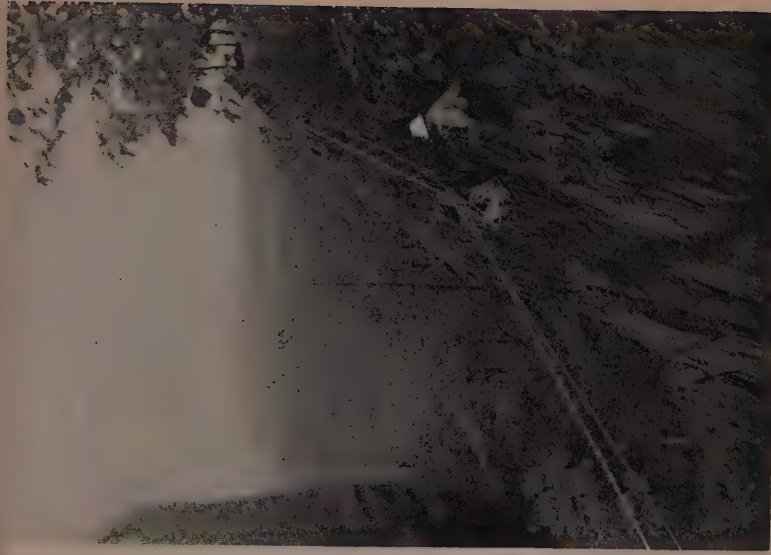


Bradford F. Swan

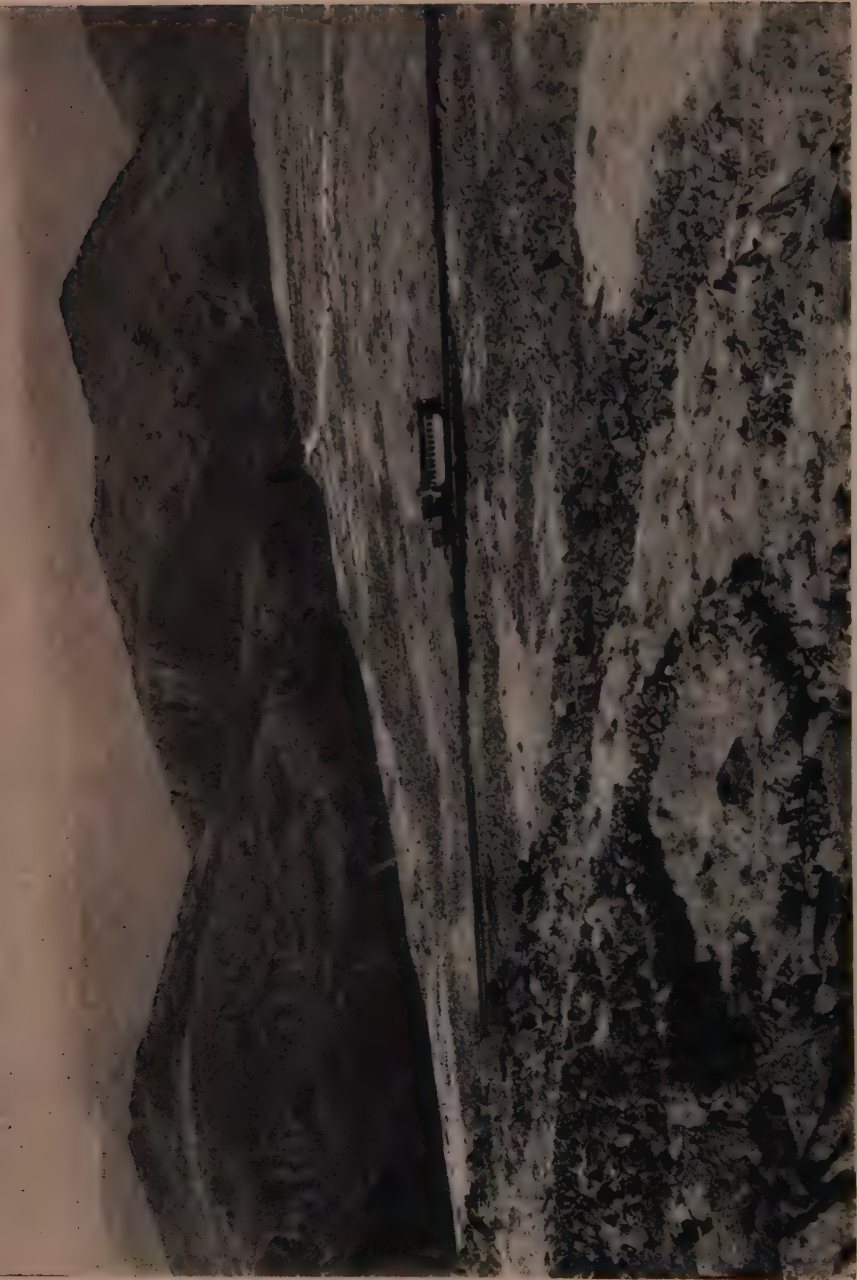
ROCK CLIMBING RESCUE PRACTICE AT PROVIN MOUNTAIN

Grade III Workshop, May 1960

(See page 250)



Bradford F. Swan



Harold Orm

NEAR THE SUMMIT OF MOUNT WASHINGTON, LOOKING NORTH

In the foreground, the remains of the old corral, built some 120 years ago

our packs a further celebration was held, this time with liquid refreshment.

Upon returning to Boston and examining the results of the weekend and a letter from the Underhills concerning their winter ascent of this mountain, the conviction that the second peak is really the highest began to take positive form. That northern peak looked higher because of the simple fact that the trees were taller.

Then came a call from John McIntosh saying that he could follow the trail to a tree blazed on four sides, one side engraved with "4M", and agreeing that here is the true summit. And on Labor Day weekend Herbert Preble removed his sign from the lower summit, followed the same trail, found the same blazed tree and erected a new sign on the tallest point of Owl's Head.

ALBERT S. ROBERTSON

Four-Thousand-Footer Club. The following have either qualified as new members since our last record was published, or were inadvertently omitted from that record:

1958. Donald M. Wallace.

1959. Richard S. Bailey, Emily W. Frankovich, John M. Frankovich, George K. Libby.

1960. Eleanor Cooley, Bradley E. Copeland, Margaret Ann Copeland (age 13), Beatrice Dorbacker, Lorraine Foster, Richard E. Keville, Bernard E. Lawson, Robin S. McDowell, Doris McGuirk, Carolyn Meyer, Frank L. Muehlberg, Kenneth L. Muehlberg (age 12, son of member), William G. O'Brien, Robert R. Prescott, James W. Schofield, John P. Vose, Peter Ward, Arthur Beach (Adk M.C. but not A.M.C.), Carolyn Meyer, Stanton H. Whitman, Ronald L. Perkins, Stephen V. F. Waite.

ALBERT S. ROBERTSON

Youngest to have climbed all forty-six 4000ers thus far is Kenneth L. Muehlberg (age 12 last April), whose father, Frank L. Muehlberg, writes as follows:

When we climbed our first mountain, Lafayette, on October 6, 1956, we little realized what this would lead to. A week later we were on top of Washington. Kenny, then 8 years old, seemed very enthusiastic about climbing and looked longingly at the other Presidentials. Next year we climbed them. Then, after seeing an article in APPALACHIA about the 4000-footers, we decided to undertake this challenge.

Most of our climbs were one-day affairs, but several times we packed in to a shelter or slept on the trail. Some trips were in the late spring, when snow conditions were uncertain and necessitated our carrying snowshoes as well. We look back on Owl's Head as being our longest and hardest climb; this we did in the downpour of tropical storm Brenda.

Besides the fact that we have accomplished our goal, a second and more rewarding factor has been the closer relationship of father and son.

Youngest girl, and youngest A.M.C. member, to have done the forty-six is Margaret Ann Copeland (age 13), who sends us the following note:

Jim Marston got us interested in the 4000-footer Club two years ago, while we were at Cold River Camp. That summer my younger sister Priscilla and I did the trip between Madison and Lakes of the Clouds Huts with a group from Camp Bendito. This past Memorial Day weekend Mr. Beltz led a trip to four of the 4000ers in the Waterville Valley. My family and I used this and another trip to Tecumseh in June as conditioners for the Range Walk. July 7 was a wonderful day for me, for then the Range Walkers began the yearly trip to all the huts. On the Range Walk my father, my sister and I picked up nineteen of twenty-one possibles. We didn't get the other two because of bad weather.

Our plan of attack for the rest of the 4000ers was to do them this summer from Cold River Camp. My father and I finished all but three, the Tripyramids and Owl's Head. These my whole family climbed the weekend before the hurricane. We did the Tripyramids on Saturday, spent Saturday night at the new and luxurious Camp 9 Brook Shelter, and climbed Owl's Head Sunday in the pouring rain.

I enjoyed myself so much while doing the 4000ers that I can't wait to do them again with Priscilla, my sister, when she does them.

After Many Years. On August 31, five Randolph women set out to walk from the top of Mt. Washington over the Southern Peaks to Crawford Notch. The aggregate age of the group was 332 years—the youngest 57 and the oldest 82. Miss Dorothy Young (82) describes the joy we all had on this wonderful day:

We started down the cone in brilliant sunshine but as we reached the Lakes of the Clouds, a few clouds appeared making us wonder whether we should go down the Ammonoosuc for safety's sake. However, by the time we had lunched on the shoulder of Monroe where we could look down into Oakes Gulf and along the alluring Crawford Path skirting the peaks, the appearance of the weather had so far changed that we decided to go on to Crawford's.

We were well rewarded because the clouds which had threatened us became a source of extra beauty casting lights and shadows on the far peaks and on the wilderness below. We were in no hurry, stopping time after time to soak in each fresh loveliness. On the slope of Clinton we rested and looked back to fix in our minds the joy the trail had given us.

Of course, as we left the inspiration of the open trail and dropped below treeline, each mile became longer than the last until we fell happily into the waiting car.

LENA WATSON

Early in September Alvan Davis, 85, likewise of Randolph, climbed up to the Madison Huts and returned. He had worked up to this by means of some shorter climbs.

SKIING

Report of the Mt. Washington Ski Patrol for 1960. The Ravine opened April 12 and closed June 2. There was a total of 8,572 skiers.

Fifteen accidents were reported, five of them major: one fracture of the lower leg (Sherburne Trail), one dislocated shoulder (lower snowfield), one fracture of the collarbone (right gully), one skull

fracture (Hillman's Highway), and one compound ankle fracture (Ravine). Two of these could have been prevented. In the skull-fracture case the skier had been warned many times to ski in control. The compound-fracture case was a climbing accident. The group had been warned four times with the bull-horn not to continue up the headwall; these warnings were ignored. On the descent one of the party slipped and slid into the rocks.

It has been recommended to the Forest Service that, if possible, another bull-horn be purchased, to be kept in the shelter. With the success of the horn in the Ravine, I think that one in the shelter would be a big factor in promoting safety on Hillman's and the snowfields. I would also like to recommend again that a set time of day be posted to keep skiers off the high elevations.

Five members of the Patrol put in from ten to sixteen days each on weekends. The seven members of the complete Patrol were: Alf Birkrem, Jim Blauvelt, Rusty Brown, Nelson Gildersleeve, Kibbie Glover, Sam Goodhue and Henry Paris.

It was an honor to receive the USEASA Safety Trophy for the most outstanding ski patrol of the year.

Once again the Ski Patrol would like to thank the Forest Service and the A.M.C. for their fine cooperation.

SWAMPY PARIS, *Chief Patrolman*

New England Ski Developments. The year 1960 again witnessed a continuation of the seemingly endless boom in New England skiing. With only a few exceptions, the big news came from Vermont, which has now pushed itself into position as the No. 1 skiing state in the nation.

Skiers headed for Stowe this winter will find the slopes of Mt. Mansfield sporting a new double chairlift of 850-an-hour capacity rising from base to summit parallel to the old single one. A new intermediate trail, starting at the Nose Dive By-pass, running through the Slalom Glades and connecting with the Perry Merrill, has been built, along with a new "super trail", possibly to be called the International, beginning near the present Lookout on the Lord Trail and continuing to the base of the mountain alongside the existing National. Two more slalom trails of about a mile length each have been cut and the Octagon has been tripled in size.

Mt. Snow brought the total number of its lifts to eight this summer, with the addition of a 7600-ft.-long chairlift in the Sun Dance area and a 2500-ft. novice lift near the base of the mountain. Total uphill capacity has now been upped to 11,100 an hour. Five new mountain trails totaling seven miles, a 10-acre lake for water shows, a 500-car parking lot, and a new Sun Dance base lodge round out the year's accomplishments.

Up in Warren, Vermont, Sugarbush Valley has completed its third year of unprecedented expansion. A new double chairlift, 3500 ft. long with a rise of 1200 ft., has been added to a set of lifts which now number a gondola, a T-bar, and two chairlifts. The Valley House has been enlarged and three new trails have been sliced down the north-east shoulder of Mt. Lincoln.

Okemo Mountain will boast a new 3000-ft. Pomalift servicing the War Dance, Arrow, and Bow—three newly cut expert, intermediate, and novice trails. This high-capacity lift, along with a new novice lift, will nearly double the capacity of the area.

Pico Peak has groomed $1\frac{1}{4}$ miles of trails and slopes cut in the fall of 1959 and increased the capacity of the main T-bar from 600 to 840 an hour by the addition of more T-bars and increased cable speed.

Killington Basin, now the possessor of the highest aerial lift in the East, has graded and seeded the Goat Path and Cascade, while constructing a new expert trail starting at the summit and running between the chairlift and the East Glade. From the bottom of the latter the new Cat Track swings down and to the right, toward the basin, to join the run-out of the Cascade Trail, completing a circuit of $1\frac{1}{2}$ miles over a vertical drop of 1750 ft. Base areas around the 2nd and Glade lifts have been enlarged to eliminate congestion and the novice slope has been widened to almost double its original area.

Hans Thorner, former director of both the Mt. Washington Ski School in Pinkham Notch and the Franconia Ski School on Cannon Mountain, is the man responsible for what is the only new ski area in the six-state New England region. To be known as Magic Mountain, this new southern Vermont area will feature a 2000-ft. T-bar, ski school slope, practice slope, trail and base station for the 1961 season. In the next few years it is hoped to put up a double chairlift to the summit and lay out an extensive complex of trails suited to all classes of skiers. These will range from $1\frac{1}{4}$ to 3 miles in length and will drop as much as 1600 vertical feet.

A new intermediate trail, to be called the Alleycat, has been finished this year at Wildcat and will be serviced by the intermediate T-bar. The Upper and Lower Lift Line Trails have also been connected for a continuous 2010-ft. drop beneath the gondolas.

Black Mountain in Jackson has completed installation of a Swiss-made Mueller T-bar, 1150 ft. long, 800 skiers an hour. The lift is in an entirely new location and will form the basis for a new area to be developed in the near future.

The Dartmouth Skiway has increased the size of Peter Brundage Lodge and the parking lot, while putting the finishing touches on a new T-bar lift and slope for novices and intermediates.

ED HURLEY, JR.

CANOEING

Upper St. John River, Maine. In June of 1960 four of us, in two aluminum canoes, ran the St. John from Baker Lake to the Clayton Lake Road. This is the same stretch described by Fred Sawyer previously.¹ Fishing was one of the objectives of the trip, so we were traveling light, carrying only dehydrated foods, and depending on fish for our protein. We experienced water conditions considerably different from those described by Fred Sawyer, who had warned us of this possibility.

Prior to leaving we had obtained permission from Mr. George

¹ APPALACHIA, December 1956, 254-7.

Blaisdell, International Logging Corporation, Chisholm, Maine, to drive over the Baker Lake Road and the Clayton Lake Road. We found that the road from St. Cyprien to Baker Lake was not available to us but this proved of no consequence. We arrived at Baker Lake on the morning of June 10 (the border is not open either day of the weekends). There we met Roger Kelly of the Maine Forest Service, who kindly volunteered to have our car driven around to our destination. He also gave us further information regarding river conditions.

We had been told by Harry Everhart of the Fish and Game Commission, who had run the upper St. John in 1959, that water conditions are extremely variable. Water conditions can rise to flood stage after heavy rains and return to unnavigable all in the course of a relatively few days. The spring of 1960 was quite wet and Roger Kelly reported two inches of rain at Baker Lake on June 5. The St. John Ponds and Baker Lake furnish some degree of stability to the Baker Branch.

Although the river had been so high that it did not permit passage of a canoe under the bridge at the outlet of the lake only two days before, it had dropped several feet and we now had ideal water conditions. We had an easy run down the rapids as far as Turner Brook, where the river widens and becomes much slower; there was obviously much more water than at the time Fred Sawyer ran this stretch. We were warned of bad rapids after Foss' Bogan on this stretch but found neither Foss' Bogan nor the bad rapids.

We camped at Turner Brook, catching enough trout for supper. This was the loveliest spot to camp on the whole trip, so we stayed two nights to enjoy the excellent fishing. We paddled on down through sluggish water on the 12th, finding the river down another foot. Since we stopped to fish feeder streams on the way we got only as far as the Forest Service cabin mentioned by Fred Sawyer. Here we ran into two fishermen who had come in by the road from St. Camille and upstream in an outboard. There had been some logging in the area around this road and both the road and bridge are now in good condition. There was poor fishing in this slow stretch, so our friends from Canada were sorely disappointed, but in the feeder streams and fast water of the St. John we found no trouble catching enough trout for supper in less than two hours each day. We were warned by them of bad rapids downstream from the bridge on the road from St. Camille but again had no trouble. However, these rapids would have been difficult in their outboard, so "bad rapids" are certainly dependent on who defines them.

Leaving the Forest Service cabin the next day we found the water down another five inches. We soon passed the road from St. Camille and the bridge, coming shortly to the end of the slow water. From here down to the confluence with the Southwest Branch the rapids were fairly continuous, with no water to spare. At the confluence we found very little water coming down the Southwest Branch and the St. John became about 200 yards wide, with numerous islands. We camped here overnight on a high bluff overlooking the river. There were signs of moose on the right bank and that night we could hear them calling. From Turner Brook all the way to Knowles Brook we saw four or five deer a day. In some cases we could sit motionless and drift to within ten yards or so of them. We passed numerous great blue heron

and on several occasions came across a duck with her ducklings trailing along behind. Trout were numerous, and we caught a couple apiece for breakfast, casting from the "kitchen" while breakfast was cooking. Unfortunately, at this point, there was no water except from the river.

The next morning (the 14th) the river had dropped even more and we found we had to walk our canoes through a few spots in the shallower rapids. About a mile downstream we found a new road and a bridge under construction. We had an easy run with few rapids down to the old hermit's cabin at Knowles Brook. Here we caught many heavier trout in the river, right in front of the cabin. The hermit, Mr. Gordon, had not been here for many years and the doors to the cabin and shed were open, with the buildings in very poor condition. We found to our dismay that there was lumbering in this area and a road had been built right into the backyard. We found tracks of moose right through camp and again could hear them calling early the next morning. Numerous grouse were heard drumming off in the cut-over area. We were visited that evening by a few fishermen who warned us once more of the "bad rapids" below. With the river in its present condition, however, we found low water the only thing "bad" about them.

We awoke to our only rain of the trip, a light drizzle. We ran on down to the Clayton Lake Road, with low water our only problem. In spots we found the river more than 100 yards wide, with a gravelbar extending across which had no more than two inches of water at the deepest point. The boulderfield at the confluence of the Northwest Branch gave us a miserable experience. We alternately carried and floated the canoes over spots where the river trickled between the rocks, only to climb back in to float over the deeper pools while the rain was soaking us from above. They could hardly be described as "quite sporty", as reported by Fred Sawyer under the heavier flow conditions he encountered, which again emphasizes the necessity of proper water conditions for maximum enjoyment of this trip. Below here it was but a short distance to where we took out at the Clayton Lake Road.

Fred Sawyer had described this stretch to me as having no rapids worse than Class II. Although I am not qualified to classify the rapids encountered, I would concur, as we had no trouble at any time. Two of us had had only a minimum of experience with easy rapids of this sort and the bow paddle of each canoe had never been in white water before. Under the water conditions we encountered there were no rapids in which we could not set our canoe against the current to select a hole between the rocks to run through. Under the proper conditions (if we had not lost our initial moderate water level by stopping to fish) beginners with sufficient practice in the fundamentals of white-water canoe handling can here enjoy a beautiful wilderness trip with plenty of white-water practice along the way.

This is no place for the incautious or for a single canoeist, as it might be many days before anyone else came along to help. We also learned that local estimates of the seriousness of rapids are quite unreliable. The A.M.C. *Canoeing Guide* with its uniform classification system will be of considerable value in alleviating this condition.

LUTHER DAVIS, JR.

The Perils of Paul: A Long-distance Mystery. One fine day last fall my morning of statement analysis for the Connecticut Bank & Trust Co. in Hartford was interrupted by a telephone call from Fran Belcher. He wanted to know if any Connecticut Chapter white-water canoes were unaccounted for, in particular one with serial number 3124-G-5-17. I didn't think so, but could not be absolutely sure. Fran was his ever-cheerful self, but there were overtones of seriousness in our conversation, a feeling that this inquiry could lead to an unhappy conclusion. Fran was on the telephone trail in response to an investigation by the Sudbury Police. Through devious channels they had been informed of an overturned canoe, with duffel lashed aboard, found adrift in Lake Champlain, and were seeking its occupants. The devious channels (as accurately as I can reconstruct them) flowed thus: hunters found the canoe and notified the Vermont State Police; the Vermont Police, after an unsuccessful search, called Grumman in Marathon, N. Y., to learn to whom they had sold canoe 3124-G-5-17; Grumman said the canoe was sold to Jabez Whelpton of Sudbury, Mass.; the Vermont authorities called the Sudbury Police; the Sudbury Police called Jabe (A.M.C. white-water purchasing agent); Jabe found that the canoe was purchased for the Connecticut Chapter and told the police to proceed through Joy St.; Fran then conducted a telephone search to find my place of employment and scored with a call to Kay Bailey of Middletown, Conn.; Fran then called me.

For some reason I had not memorized Connecticut Chapter canoe serial numbers, and Fran's inquiry was too urgent to delay until I could get home to check my records. Ha! I had a solution. I called Lydia Loveday at the Adams Insurance Agency in New Haven and had her read off the serial numbers from the agent's copy of our insurance policy. There was No. 3124-G-5-15 and No. 3124-G-5-16, but no No. 3124-G-5-17. Now this was a very embarrassing turn of affairs. Joy Street had had an anxious moment, but my morning on the telephone was just beginning. For with the evidence in hand, I with all assurance telephoned Fran to call off the dogs. The canoe was mine, and the missing canoeist was me!

Why had I not owned up immediately at Fran's call? True, I had smashed up and temporarily abandoned my canoe some three weeks before on Paul's Stream, an innocuous name given to the devilish channel which the overflow of Maidstone Lake takes in order to empty into the Connecticut River in northern Vermont. The channels of communication proved to be equally devilish, and somewhere, somehow, "Paul's Stream" was garbled and reached my ears as "Lake Champlain". Also, at the time of the accident I thought my duffel had been swept away, when in fact it had not. I could not see it from shore, and was not ready to challenge Old Paul again, for a closer look, without help. Therefore, the report of a canoe with duffel found in Lake Champlain misled me. However, my canoe had been shipped on the same order as the Chapter canoes, and I remembered that the serial numbers ran consecutively. The weight of evidence after my call to Lydia definitely confirmed my first unspoken suspicion.

I called the Vermont State Police in Montpelier. Montpelier had heard of the case of the missing canoeist, but referred me to the St. Johnsbury Barracks. I called St. Johnsbury. They had heard of the

case also, but referred me to Officer Potvin, who would be checking in at the Island Pond Gulf Station. With some misgiving I called the Island Pond Gulf Station and asked for Officer Potvin. For my transgressions I now faced the Moment of Truth. I identified myself and told my tale to the officer, who had personally conducted a search for my body. His reply was, "Mr. Moulton, it certainly is a pleasure to be talking to you."

GARDNER W. MOULTON

ACCIDENTS

On Mt. McKinley, May 17. In mid-May three parties were engaged in climbing Mt. McKinley by Washburn's West Buttress route: (1) a Japanese party from Meiji University, the earliest in the field and the first to reach the summit (where they set up a pole strung with the American, Japanese, Alaskan and Meiji University flags); (2) a group from Anchorage, Alaska—composed of Paul Crews, Dr. Rod Wilson, Andy Brauchli, Chuck Metzger and Mrs. Helga Bading—who had been flown to the mountain on May 7 and were slowly making their way upward; and (3) a party, chiefly from Seattle—composed of Peter Schoening, James and Louis Whittaker, and John Day—who had started last but, moving speedily and assisted by airdrops, caught up and passed the Anchorage party on May 16. That evening these last two parties camped near each other, at altitudes of about 16,400 and 16,600 feet respectively.

Next day both parties made the summit (except that Mrs. Bading, of the Anchorage group, remained in the high camp, as she was suffering from altitude sickness), reaching it together at about 7 p.m. The Anchorage group started down first, with the others some 40 minutes behind. At about 11.30 p.m., while they were descending a steep section of wall below Denali Pass, the Seattle party slipped and fell some 400 feet. All, as it turned out later, were more or less injured: Day had a broken leg, Schoening severe head injuries and a frozen hand, the two Whittakers frostbite. There is no information on just how or why the slip and its sequel occurred, but both parties are said to have been at the point of exhaustion, and under such conditions a slip on the part of one man and a failure to check it on the part of the others are only too easy to understand.

Fortunately, the Anchorage party had seen the accident and were within shouting distance. On being told what was needed one of them (Paul Crews) fetched the Seattle tent and erected it over Day, who could not well be moved but had been placed in a sleeping-bag and anchored to the slope where he had fallen (at about 17,400 feet). The other three members of the Seattle party managed to return to their campsite 800 feet below, Schoening and Jim Whittaker however in a state of shock; while the Anchorage party, too exhausted themselves to do more at the time, likewise returned to their own camp.

Early the next morning Dr. Wilson climbed up to do what he could for the members of the other party, while his companions got an emergency call through to Anchorage asking for medical and other supplies and an evacuation by air of the injured men. There seemed

to be a possible landing-site for a helicopter not far from where Day was lying, and to this the whole Seattle party managed, with considerable difficulty, to climb. A helicopter did show up that afternoon, but did not venture to land, and the same thing occurred with another the next morning (May 19). However, on the 18th Don Sheldon came over in his Super Cub and dropped the needed supplies; and on the 19th and 20th further airdrops were made, which included some akja stretchers. Meanwhile, Mrs. Bading had become progressively worse, and her life was despaired of unless she could be got to a lower level promptly. Placing her upon a stretcher, Crews and Metzger lowered this down 2000 feet, part of the way being over a steep ice slope where elaborate braking methods had to be used. At 14,400 feet they found Don Sheldon, who had succeeded in landing his plane there; he at once took off with Mrs. Bading (and in the hospital she eventually recovered completely). Sheldon's landing at this place was made possible thanks to information given him over the telephone by Bradford Washburn in Boston, who knew the terrain intimately.

Late that same evening (May 20) Link Luckett, a contract pilot, performed the feat of landing his helicopter at 17,200 feet and taking out John Day. The next morning he returned and did the same for Pete Schoening. These are, by 1000 feet, world-record helicopter landings.

But on the same day a bush pilot, Bill Stevenson of Spenard, Alaska, and an Army sergeant were killed when their light Cessna 180 plane crashed against the mountain near the Seattle camp. Our accounts do not state whether these were two would-be rescuers, and if so how they fitted into the general program. At any rate their deaths, of which little is said, were the major casualties connected with the entire episode.

By this time a large ground-rescue party of some 50 men was well up the mountain. Some of these were from Anchorage while the others, sent by the Seattle Mountain Rescue Council, had been flown up to Alaska by commercial airliner. On May 20 several of these men, including Dee Molenaar of Seattle, had reached a camp at 14,400 feet, and on May 21 some of them, joined by Crews and Metzger, ascended to the high camp of the Anchorage party at 16,200 feet, to which Wilson and Brauchli had now brought down the Whittaker brothers. All then descended in the face of an oncoming storm. One section of the large rescue party held out this storm in the camp at 14,400 feet, the rest in a camp somewhat below. The storm proved to be a two-day affair which put down two feet of snow accompanied by a very high wind, and with their tents collapsing and in imminent danger of being blown away the parties faced the chance of a final catastrophe. Eventually all were able to descend safely to 10,200 feet, from where they were flown out on May 25-6 either by Sheldon or by Army helicopters.

(Information derived from newspaper reports and a circumstantial account by Paul Crews and others.)

An Afterword to the Tragedy on Mt. Jefferson in 1941. Having for several years slothfully resisted the requests of our gracious editor to give further information about a mountain death, and about a rescue in which I took part, I finally take pen in hand in hope that

these words may help some reader to avoid making the grievous errors committed, but not reported, at that time.

On stormy October 12, 1941, a party of nine left the Jefferson Notch Road intending to climb over the Caps on Mt. Jefferson to Monticello Lawn, continue along the Gulfside Trail through Edmands Col, and drop down to Crag Camp for the night. [See APPALACHIA for December, 1941, pp. 550-3. According to the account given there, by one of the party themselves, no mistakes of any moment were made, only one member of the group was exhausted, and even he probably did not die of exhaustion and exposure but of some antecedent ailment or organic disability. The present report, by one of the rescuers, had been requested in order that, however belatedly, the record may be set straight.—Ed.] Darkness overtook the exhausted climbers as they reached the Gulfside Trail on Monticello Lawn and they decided to turn back. Louis Carl Haberland, *still dressed in shorts*, was particularly tired and soon had to be relieved of his pack and assisted by the others. The inch or two of snow that had already fallen froze hard and sleet continued to cover the rocks with ice. The strong wind had not dropped at sundown and it made balance precarious on the steep, ice-covered rocks of the Caps. In three hours the party progressed less than a mile. In the scanty shelter of the Caps they decided that six of them should camp and the other three go for help. Some *but not all* of Haberland's wet clothing was removed and he was slipped into a sleeping-bag. He was given a bite to eat and a *slug of whisky* before the others left him, exposed to the weather out from the overhanging rock and in the middle of the trail. (I know very well where he was, for I tripped and fell full length on his dead body a few hours later.) The others bedded down in equally exposed places a few feet higher.

That same day we three ardent young climbers in Jefferson—Dr. Edgar A. Bering, the late Peter Hunsaker and I—had changed our plans and not stirred out of the valley all day; the weather was not fit for man or beast. About midnight we answered the knock on the door and admitted the exhausted three who sought help. After packing medical supplies, food and drink (the hot water heating the thermos bottles was taken by mistake in place of the tea), we set off and at about 3 a.m. quite literally stumbled onto the camp on the Caps. Dr. Bering examined Haberland, who had died from exposure at least an hour before. After fortifying the rest with quantities of syrupy warm water—hot tea would have tasted so much better, but the water and sugar did bring energy back to the cold, exhausted climbers—we dressed them partially in their clothing and partially in ours, because they could not find many of their things in the dark. Pickabacking someone down off the Caps over the *verglas*-covered ledges is tricky business, but we had the whole party back at our home in Jefferson soon after 6 a.m. Dr. Bering stated that if we had not stirred them, fed them the sugary drink and brought them down, it is a sure thing that at least one more of them would have died in the night. As Dr. Kreider stated on the first page of the last APPALACHIA, "It is unbelievable to most people that death can be caused in less than 24 hours by exposure to temperatures which, while low, are still above freezing". Too few people realize that the dividing line between exhaustion and death is

so thin. A little easily assimilated food, a little more clothing and shelter, and preventing an exhausted climber from relaxing and giving up until he is in proper medical hands can make all the difference. The author of the 1941 article doubted that exhaustion and exposure could have been the cause of death, but there is no room for doubt.

Critique: I am not trying to pin the blame on anyone, but merely hoping to point out mistakes so that others may avoid them.

1. *Time schedule.* The A.M.C. *White Mountain Guide's* usually conservative time estimates give $4\frac{1}{4}$ hours as being needed for the whole trip and $2\frac{1}{4}$ hours to the point where they turned back. My notes show that they left at 12.15 p.m., in which case they would have had sufficient time before dark at 5.30 p.m., if weather conditions had been favorable and their loads lighter. The APPALACHIA article states that they left at 2.15 p.m. In this case *it was obvious that they would be benighted*. Even though they had flashlights, their start was much too late. A flashlight would be little help in dense clouds or a driving snowstorm after dark.

Regardless of the time of departure, which was admittedly too late, *their turn-back hour was even more foolishly late*. Even if their departure time was the later of the two, it should have been obvious that they were falling way behind schedule, taking, as they did, an extra hour for the first section. If they left shortly after noon, the section, scheduled for $2\frac{1}{4}$ hours, took them $5\frac{1}{4}$ hours.

2. *Weather.* At the nearest weather station on the top of Mt. Washington, there was some form of precipitation the whole time they were on the mountain: rain, snow or sleet. Temperatures varied from 22° to 32°F. The winds varied from 21 to 48 miles per hour. This is the sort of weather when it is the most difficult to keep warm, much more difficult than when it is colder but the snow is drier. No one should venture above timberline in such weather.

3. *Clothing.* The party had *adequate* clothing but *did not use it*. Haberland wore shorts until after they turned around. After they decided to make camp, some of Haberland's wet clothing was left on him.

4. *Food and drink.* Although one of the boys sent up to bring down their gear afterwards remarked that they had enough food to start a store, apparently they made little use of it. A cardinal rule in the mountains is to *eat a little often*. There is no quicker way to get exhausted and lay yourself open to exposure than to stop eating. Haberland was finally given a sandwich and a piece of chocolate, when he needed something easily assimilated.

One of the *worst mistakes* was to give him *whisky*. Whisky is not a stimulant, as the 1941 article stated, but the opposite. Alcohol should be used sparingly or not at all in accidents, since it dilates the capillaries and allows great heat loss and then acts as a depressant.

5. *Shelter.* Much more use could have been made of the natural shelter under the overhanging rock. A tent could have been improvised from blankets and the primus stove used to prepare a hot meal. The climbers should all have bunked together side by side to keep each other warm.

I still shudder when I think about how this party made nearly every possible mistake and paid a tragic penalty.

ADAMS CARTER

TRAILS

Connecticut's Roving Trail Crew. For the fifth consecutive year Connecticut's Roving Trail Crew headed north to contribute a week's effort to help maintain A.M.C. trails in the White Mountains. This year the rendezvous was at Greenleaf Hut. The date, Saturday, July 23; the crew, Sey Smith, Marie Carden, Lud Fehrenbach, Jean MacKesson, Fran Bird and his son Dave, Shelton Hickok and Charlie Krug.

Dobie Jenkins, A.M.C. Trail Supervisor, tramped in to join the crew for afternoon coffee. The hospitality of Tom Deans, hutmaster, and his two assistants, Jim Hamilton and Bob Kreidler, left no doubt as to our welcome. An auspicious and congenial beginning. About 11 o'clock that evening Sam Goodhue, A.M.C. Councillor of Trails, checked in.

Sunday the mountain was socked in pretty solidly, but the mist had burned off by the time the crew had dealt adequately with a Bunyanesque breakfast. Then down the Greenleaf Trail to Eagle Pass, where we started clearing back toward the hut. The trail was badly overgrown, increasingly so the higher we got. Progress seemed slow, but it was mighty rewarding to look back down a well-cleared trail, some six feet wide and eight feet high. Since it was Sunday, the quitting whistle blew at 3 o'clock, with just a short stretch still to be cleared. Back at the hut, a quick splash in Eagle Lake—at least for the more rugged.

Monday was another fine day, with the valleys filled with mists while the summits nuzzled fleecy clouds. Both Sam and Dobie had referred casually to a small patch of puckerbrush that needed cutting in the col between Lafayette and Lincoln. Unsuspectingly, the crew headed up Lafayette. The views were gorgeous and the horizon wide, especially across the Pemigewasset wilderness with Washington, Adams and Madison cloud-capped in the far distance. On across to Lincoln, where we got a better understanding of those casual references. You had to force your way through that stuff. One camp group went struggling through just after we started clearing. Luckily it was a short section. Luncheon break, on the eastern slope of the col, was welcome. We watched with genuine satisfaction as another camp group swung easily through our Boulevard of Clipped Spruces.

Tuesday morning we finished that last section of the Greenleaf Trail and in the afternoon we cleared the Old Bridle Path down to the first "agony". The hutboys' gratitude after their daily pack trip was ample reward.

On Wednesday, appropriately dismal, the Roving Trail Crew bade their hosts farewell and headed down the Greenleaf Trail, to start the trek in to Lonesome Lake Hut, our base for the rest of the week. Since foul weather turned worse, with drenching rain, we spent a lazy afternoon at Lonesome. Here, too, Nick Prentiss and his assistant, Al Eckes, looked after us in first-class manner.

With Tony MacMillan, our host at Carter in 1959, as an added starter, on Thursday we tackled Fishin' Jimmy Trail to Kinsman Pond and on over the Cannon Balls, where No. 2 needs work to bring it back to standard. Then into Coppermine Col.

Our job on Friday was Cascade Brook Trail. Only light brushing was required to the junction with Kinsman Pond Trail, which showed signs

of recent work westwards. A little bushwhacking, then over the Round-the-Lake Trail back to the hut. Dobie came in for a farewell powwow. After lunch, before tackling the Round-the-Lake Trail, the crew lent a helping hand to Dobie as he set trail-sign posts. A final swim and good supper and the 1960 Connecticut Volunteer Trail Crew trip came to a satisfying end. Here's looking forward to 1961!

CHARLIE KRUG

Terrace Mountain Trail. The route described in the new edition of the *Guide* (p. 358) was well cut out last summer and the Forest Service expect to take it over and maintain it as a regular trail. It is recommended that the round trip be made from north to south—that is, from Bunnell Notch to Willard Notch. Total time, from and to the end of the York Pond Road, 4-5 hours.

Appalachian Mountain Club Maine Guide. The preparation of a guide to the mountains and trails of Maine has been approved by the A.M.C. Council, and work on this project has been underway during the summer and fall of 1960. The A.M.C. *Guide to Katahdin* and the Appalachian Trail Conference *Guide to the AT in Maine* have each gone through a number of editions, but there is no one guidebook covering all the state (aside from the booklet, *Mountain Climbing in Maine*, published by the Maine Department of Economic Development), and many sections such as the trail-rich Mount Desert Island summits, the compact and scenic Camden Hills, and the isolated and interesting mountains close to the Quebec boundary are without any recent trail descriptions at all. The guide will include on an expanded basis the mountains of western Maine which are in the A.M.C. *White Mountain Guide* and will incorporate the material now contained in the Katahdin guide.

The chapter headings as they have been outlined give an idea as to the scope and organization of the book: Katahdin, Aroostook, East of the Penobscot, Mount Desert, Camden Hills, Southwestern Maine, Oxford Hills, Northwestern Mountains, Rangeley and Stratton, Upper Kennebec, and the Piscataquis Mountains. About 100 mountains will be described and the book will total about 240 pages in addition to the maps. (In comparison, the 1956 Katahdin guide has 89 pages and the 1960 White Mountain guide has 511 pages. The first edition of the White Mountain guide, published in 1907, had 215 pages.)

The preparation of the book is under the general direction of a committee of Portland Chapter members: Leroy Cross, John Vose, and Charles Ranlett, Chairman. Robert Lennox and Stephen Harriman are preparing the maps. Field information—and this is the largest part of the undertaking, particularly as much of the book must be prepared from scratch—has been received from both members and non-members. The extensive section on Mount Desert has been prepared by Echo Lake Camp and coordinated by Charles Kirkpatrick.

At this writing final publication date is not yet set. Field work is progressing well and, if this can be completed before snowfall, we hope to publish in 1961.

CHARLES RANLETT

SCIENCE

The Mt. Washington Observatory News Bulletin, which first started publication in 1933, has launched a new schedule this fall. Issues will appear quarterly in September, December, March and June, and articles will reflect changes in both the weather on the mountain and the activities of the Observatory. Regular departments of the *Bulletin* will be: news of the mountain (including stories about life at the summit from those who know it best, the Observatory summit crew); Observatory affairs (new business of the Observatory); and the research program (summarizing the scientific work at the summit). Monthly charts of summit weather for the preceding quarter will be included in each issue. Another new departure for the Observatory is a different schedule of membership. Regular membership, including receipt of the *Bulletin*, is \$2; sustaining membership, including the *Bulletin* and reprints of technical articles concerning Observatory scientific work, is \$10. Donations beyond membership are deductible for Federal income tax purposes. Most of the officers and trustees of the Observatory are members of the A.M.C., and any other members of the A.M.C. who are interested in the Observatory and its work are more than welcome to join. (Checks should be made payable and sent to the Mt. Washington Observatory, Gorham, New Hampshire.)

In the September issue Dr. Wallace E. Howell, Director of the Observatory, summarizes changes in the nature of the work that has been carried out at this unique weather station. From an early emphasis on weather data and forecasting there was a gradual shift to fundamental studies of cloud physics and the mechanisms according to which electricity is generated in a thunderstorm. Obviously, the Observatory is perfectly situated for analysis of what goes on within a cloud. Then, beginning with studies of icing on aircraft structures mounted near the summit, the Observatory's program soon expanded into analysis of the fundamental properties of clouds—drop size, liquid water content and the physical process of droplet formation and change.

Now the Observatory is concerned with the pollution of whole air masses and the spread of polluted air over entire regions—and indeed, over the whole world. Now that the atmosphere is used increasingly as a natural wastebasket, the question of exposure to atmospheric pollution, including that from radioactive materials, is a possible health problem of the first magnitude. In addition, the Observatory is concerned in a major way with an analysis of the effects of cosmic rays as observed above a substantial part of the earth's atmosphere. Here, again, the Observatory's unique location is a major asset. It serves, in effect, as a stationary airplane for high-altitude observations. Experiments can be carried on at leisure for a thorough analysis of high-altitude phenomena which cannot possibly be studied at the speed of a jet plane.

ALAN A. SMITH

CONSERVATION

The conservation record of the 86th Congress is meager. Its major accomplishment was the Multiple Use Forestry Bill (Public Law 86-517).

Generally regarded as a milestone in resource management, this measure establishes multiple use of national forests (it does not apply to park lands) as a policy of the Congress and formalizes procedures long followed by the U.S. Forest Service. Recognized as proper uses are outdoor recreation, range, timber, watershed protection, and wildlife and fish. It is made clear that wilderness preservation is consistent with the act. The measure, however, is declared "to be supplemental to, but not in derogation of, the purposes for which the National Forests were established".

Among conservation measures of interest which have been passed are:

Sikes Military Lands bill, which sets up procedures whereby state wildlife agencies and commanders of bases can manage public hunting and fishing on U. S. military reservations.

An act providing for the protection of forest cover for reservoir areas under ownership of the Corps of U.S. Army Engineers and specifying management of timber for sustained yield, reforestation and conservation practices to increase their value for conservation and wildlife.

A new Haleakala Park was created out of a portion of Hawaii National Park.

The boundaries of Dinosaur National Monument in Colorado and Utah were revised after defeat of a move to make grazing on the area a "right" rather than a privilege. A badly needed access road was provided here.

Additions to the National Park system were the Arkansas Post National Memorial, Bent's Old Fort National Historical Site (Colorado), Minute Man National Historical Site (Massachusetts) and Wilson's Creek Battlefield National Park (Missouri).

An act looking to the preservation of historical and archaeological data which might be damaged through the construction of water impoundments.

Several conservation losses are attributable to the 86th Congress:

The Conservation Reserve Soil Bank program was not extended beyond its current expiration date of December 31, 1960. Though endorsed by the Administration, the Conservation Reserve comes to a halt with 29,000,000 acres retired.

Although protection for Rainbow Bridge was specifically authorized in the Colorado River Storage Project Act of 1956, Congress refused to appropriate any funds for the works necessary to protect this natural wonder from the water backed up by the new Glen Canyon Dam.

The controversial fire ant control program was continued at the \$2.4 million level, to be spent only in states which participate financially.

Most proposed conservation legislation was not acted on and will appear on the program of the 87th Congress:

The Wilderness Bill achieved another "clean" version after many hearings, but was not acted on in Congress. The present form, while keeping the salient features of protection of wilderness, should meet all reasonable objections, and there seem good prospects of its passing early in the next session.

The Chemical Pesticides Coordination Act, to require any Federal agency to consult with the U.S. Fish and Wildlife Service before

initiating a chemical pesticides program, was reported favorably to both Houses late in the session and with more time should pass.

A bill for a nine-million-acre Arctic Wildlife Range in Alaska passed the House but not the Senate. The Range may now be established by Executive Order.

Numerous hearings were held but no action was taken to establish the following proposed national parks: Great Basin (Nevada), Padre Island (Texas), Point Reyes and Channel Island (California), Oregon Dunes (Oregon), Chesapeake and Ohio Canal (D. C.), Ice Age (Wisconsin), and Cape Cod (Massachusetts)—though our Congressmen seem optimistic about the last. Nor was any progress made towards ordering the National Park Service to make a survey of the Northern Cascades (Washington) or of the volcanic Cascades (Oregon).

MARJORIE HURD, *Chairman, Conservation Committee*

Conservation in New York State. The failure of the Citizens' Northway Committee to block the progress of a super-highway through the Forest Preserve (APPALACHIA for June 1960, p. 123) has focused attention on the need for continuing alertness and constant interpretation in order to retain the "forever wild" status of the Forest. Further current threats are the sustained high water in Lake George, damaging state-owned islands, the improperly codified water resources act, the lease of Hunter Mountain lands for private ski development, and the proposal to zone the Preserve for (1) wilderness, (2) recreation, (3) controlled forestry and wildlife. An expanded organization has been set up, to be known as the Citizens' Forest Preserve Committee, with the purpose of furthering the principles of conservation stated in the New York state constitution, viz., "The lands of the state, now owned or hereafter acquired, constituting the forest preserve as now fixed by law, shall be forever kept as wild forest lands. They shall not be leased, sold or exchanged, or be taken by any corporation, public or private, nor shall the timber thereon be sold, removed or destroyed."

CHARLES LAURISTON LIVINGSTON, JR.,
Chairman, Conservation Committee of New York Chapter

Nubanusit. Over a year ago a group of conservation-minded people including some members of this Club, decided to try to save Nubanusit Island, a beautiful wild stretch of pasture and woods on Lake Nubanusit in the southwestern part of New Hampshire. Through the efforts of this group and Nature Conservancy, a national organization with headquarters in Washington, which devotes itself to preserving beautiful wilderness areas, a campaign was begun to raise funds to save the island.

Although only about half of the amount necessary to purchase the whole island has been subscribed, arrangements have been made to purchase the eastern half for \$50,000, with an option for four years to purchase the other half for an additional \$50,000.

OWEN TUDOR

Another Seaside State Park in Maine. A new state park, known as the Two Lights State Park, will be completed by the end of 1960 at

Cape Elizabeth, Maine. This headland has a rocky shoreline unfit for bathing but it is a fine place to observe the open Atlantic and the pounding surf. On the site is a growth of spruce and fir so typical of parts of the Maine coast. The park will be designed for day use. A parking area for 130 automobiles is planned, along with 75 picnic sites and 45 picnic stoves on the rocky shore. Within the park area stands a concrete observation tower that was used by the armed services during World War II. From this tower it is possible to see Mt. Agamenticus and also Mt. Washington. Nearly adjacent to this park is Crescent Beach, a fine sandy beach about one mile in length, that is being purchased by the state of Maine for another shoreline park. These two parks will have heavy use; they are much needed in this part of Maine.

CHARLES B. FOBES

NATIONAL PARKS

The Nature Guide Service in the national parks is forty years old this summer. In 1920 Stephen T. Mather, first Director of the National Park Service, invited Dr. Charles M. Goethe and his wife to start a naturalist project in Yosemite Park. The Goethes had been impressed in Europe with recreational programs based on nature study and had adapted the idea at Lake Tahoe. From its small beginning, the program of guided tours, talks, trail and roadside exhibits, publications and colorful museums has expanded to employ a staff of some seven hundred ranger naturalists, historians and archaeologists. Through them, last year, our parks and monuments were interpreted to over ten million visitors. For his part in pioneering this unique educational scheme, Dr. Goethe was, on the fortieth anniversary of its initiation, awarded the Department of the Interior's Conservation Service Award.

Glacier National Park this summer celebrated the golden anniversary of its establishment. It was Representative (now Judge) Charles Nelson Pray of Montana who introduced enabling legislation and shepherded it through Congress. Judge Pray, now ninety-two, was guest of honor at the anniversary banquet sponsored by the Chamber of Commerce in Kalispell, Montana, where he received a scroll from the Secretary of the Interior and numerous congratulatory letters and telegrams. As principal speaker, he reminisced about the tough sledding of early days when opponents claimed that with Yellowstone on its southern borders, Montana did not need another park. Asking for \$175,000, the department's estimate of one year's requirements, Rep. Pray managed to secure an appropriation of \$50,000 for a small beginning in the construction of roads and trails. In 1911, its first full year of operation, the Park received 4,000 visitors, last year 722,000. Lying astride the Continental Divide, the Park contains some of the most spectacular scenery of lakes and mountains in the entire Rocky Mountain region. Today this 1600-square-mile park has 300 miles of roads and over 1000 miles of trails which lead the tramper and horseback rider into the remote wilderness areas.

MARJORIE HURD, *Chairman, Conservation Committee*

Teton Fiasco. On September 3 a group of us left Jenny Lake for Amphitheater Lake, planning to spend three days. We had signed out for Mt. Owen the first day, then Disappointment Peak and Teepee's Pillar. The party consisted of George Billings, another Dartmouth student, a graduate of the University of Wyoming, and I. On arrival at Amphitheater Lake in late afternoon in the rain, we found that an accident had taken place. Two college students who had not properly signed out had been climbing down from Disappointment Peak, had got off the route, and one of them had fallen approximately 150 feet onto the talus below the cliffs. A third party was coming down from Owen at the time and these people did all they could and informed us of the accident. One of them had gone down for help. The two Dartmouth students, who had had first-aid training, went up with a stove, some soup, and warm clothes; they took turns staying there until the rescue squad arrived. One of them put the fellow in his sleeping-bag, still unconscious and in bad shape. At 7.30 the first party arrived, and at 8.30 the main group. They were assisted in the evacuation by our party. When they reached our campsite at the end of the trail, the ranger in charge came over and told us to stay off Mt. Owen, since climbing was closed after a rescue. We did not consider that this was entirely fair, since all other parties in the mountains would still be climbing; only signing out was closed. Since we happened to be there, we had supplied a sleeping-bag and helped with the evacuation; and since we happened to be there, we were prohibited from climbing! But we were told that we were "just one less party to worry about". We were also told rather peremptorily that they had spent \$3500 so far on six rescues and they d—— well weren't going up again. Yes, we could go ahead and climb Owen if we wanted to, but if we had an accident they would let us rot up there. There would be no more trained rescue team after tomorrow and any party climbing would have to provide their own standby rescuers or else not be allowed to go. We took this to mean that even if we stayed over a day to let the rescuers rest, as is usual, and for which we had food enough, we would climb at our own risk. We went down.

Back at Jenny Lake in the morning, we received a rude awakening. People were being signed out that very day for climbs. Climbing was not closed even for one day, to say nothing of the rest of the season. And the rescue team was in fact available, and would be for the next three days. Being one less party to worry about seemed rather meaningless when they weren't worrying about anybody. We got the distinct impression that carrying our three days' food to Amphitheater Lake did no one any good, but should have. The weather was good enough that day for a try at Owen; the next day turned out to be a perfect one. Unfortunately the ranger in question was not available for comment at the time. So went our last climb of the season.

BRIAN UNDERHILL

WHITE MOUNTAIN NATIONAL FOREST

News from the White Mountain National Forest. A 180-foot suspension bridge on the Wilderness Trail at the old Camp 17 trestle in

the East Branch of the Pemigewasset valley was completed September 1.

A contract has been awarded for construction of 2.7 miles of road from the Tripoli Road to Russell Pond in Woodstock. Construction is proceeding on schedule and the road should be completed by July 1, 1961. Surveys are in progress at Russell Pond and plans for this new recreation area will be drafted this fall and winter.

White Mountain National Forest and Appalachian Mountain Club crews have cooperated in the construction of two new frame-type, open-front shelters at Hermit Lake in Tuckerman Ravine in an effort to maintain suitable camping facilities at the area.

Work is progressing satisfactorily on the new Campton Campground and the area will be open for public use next summer. Repair of the recreation facilities at Lower Falls and Rocky Gorge Picnic Areas on Swift River, along the Kancamagus Highway, will be completed this year.

Recreation use on the White Mountain National Forest was very high this summer and the total use for 1960 may exceed the 1959 record of 2,450,000 visits.

A second automatic repeater, located on Cannon Mountain, has been added to the Forest's radio network. This repeater provides improved radio coverage on the west side of the Forest, particularly for the Pemigewasset Ranger District.

The New Hampshire Department of Public Works and Highways is preparing plans for complete repair of flood damage on the Kancamagus Highway. A grant of \$200,000 in Federal Lands funds has been approved and will help further the rehabilitation work on this highway. Funds now available are still not sufficient to bring all the remaining gravel sections up to standard, but an estimated 75% of these will be rehabilitated or under contract by the end of calendar year 1961.

In addition to the four-man fire detail to Montana in July, the White Mountain National Forest sent Kenneth Sutherland, District Ranger at Plymouth, Forest Archibald, District Assistant at Conway, Charles Bartlett, Assistant Ranger at Conway, and Evans Lutz, Assistant Ranger at Norway, Maine, on a firefighting detail to the California Region on August 21. These four were engaged in fire-control work on large fires on the Tahoe and Truckee National Forests.

GERALD S. WHEELER, *Forest Supervisor*

Excerpts from the Report of the Range Patrolman. Edmands Col Emergency Shelter is presenting a problem since groups camping out there do not realize that the shelter is not designed for overnight camping, but is for emergency use only.

Camp groups met this summer were in general well led, with the usual number of exceptions. I met a number of groups with leaders who had attended one of the A.M.C. leadership clinics and without exception these groups were well equipped and well led.

The most unorganized, poorly equipped groups were generally small groups of 1-5 people. I think the worst trails for these people are the Daniel Webster (Scout) Trail from Dolly Copp Campground to Mt. Madison and the Jewell Trail from the Base Station to Mt. Washington. Many of the people on the Daniel Webster were met late in the day

when they should have been down off the high peaks. They didn't realize how long it would take them to climb and had made no plans to stay at Madison. The Jewell Trail is a problem because so many people see the trail late in the day and decide to climb Washington. The trail is at first very easy but it takes you above timber a good two miles from any type of shelter and is therefore very dangerous to these one-day climbers in their low shoes and short-sleeved shirts. Many of these people either don't bother to read the warning signs or simply don't believe them.

Trampers have again this year been quite careless about littering the trails. The people who use the Tuckerman Ravine Trail seem to be the worst offenders. I policed this trail at least ten times during the course of the summer.

The Great Gulf shelters seem to be very popular. I believe that at least one more lean-to is needed in that area.

E. HASTINGS, *Range Patrolman*

LETTERS FROM OUR READERS

"The Longfellow Mountains of Maine." I must confess to having just now read, under Nomenclature, your reactions to the title, "The Longfellow Mountains of Maine". I quite agree that the name suggests pleasant, gentle hills.

My suggestion is that a name should be chosen with more of a mystical and rugged and perhaps inspiring connotation, also a name lending interest for publicity and promotional advertising. When the white man arrived and explored the region now Maine, he found numerous Indian tribes. All these tribes were Abnaki [or, Abenaki], "People of the Dawn". The Penobscots and the Passamaquoddies were all Abnakis. So, if the Maine mountains were to be called the "Abnaki Mountains" ("Mountains of the Dawn"), that would seem appropriate, for Katahdin and Cadillac are equally mountains of the dawn.

Let "The Abnaki Mountains" be considered a generic name for all the mountains of Maine. Then each neighborhood could continue its publicity use of its special feature, e.g. the Acadian Range of Mount Desert, etc.

A similar generic name could be "The Algonquin Mountains". Both of these names have a rugged sound, similar to "Adirondack", but I rather prefer "Abnaki" because of the translation, "People of the Dawn".

Up to now I have not seen or heard the name "Longfellow Mountains" used in any State of Maine publicity.

FREDERICK E. OLFENE

Weston, Mass.
September 29, 1960.

BOOK REVIEWS

Himalaya Venture. By Fritz Kolb. Translated by Lawrence Wilson. London: Lutterworth Press, 1959. 148 pages, 15 illustrations, 3 maps. 15 shillings.

This book is the pleasing account of three trips in the Himalaya by a German schoolmaster and his various companions in 1939, 1945 and 1946. At the end of the first trip he was interned in India and after the war managed several more forays in the mountains before he returned home. The expeditions were unpretentious and with modest goals, so that despite the vicissitudes of war, officious police, and other hazards achievements were good.

The writing is straightforward and the translation well done. The format is good and the illustrations excellent. Altogether this is a book which does full justice to the trips it recounts, the type of trips which the average climber can find well within his powers.

KENNETH A. HENDERSON

This Is the American Earth. By Ansel Adams and Nancy Newhall. San Francisco, California: The Sierra Club, 1960. xviii, 89 pages, 95 photographs. \$15.

Here is a volume of utmost interest and importance to us of the A.M.C. The authors are well known. Ansel Adams, one of the nation's leading photographers, has published many books, and Nancy Newhall, the author of several books centered around photography, is a researcher of note. A few years ago these two combined their talents to create an exhibit of photographs with accompanying text in order to "help explain what National Parks are all about". First produced in Yosemite, this exhibit was later circulated throughout the United States, and also abroad through the U.S. Information Service. But the compilers, from the beginning, had felt there should be a book, broader in scope, so from the prelude of the exhibit grew the present volume.

The force of the book's message—how mankind has changed the natural face of the earth and the implications of this for us here in America today—lies in the marvelously skilful synthesis of photographs and text. About half the 95 photographs are by Ansel Adams, the remainder being chosen from the work of over thirty different photographers. In themselves most of the pictures are masterpieces—some documentary, some of rare beauty, such as the six chosen to introduce the book in a section called "Overture". Similarly, Nancy Newhall's poetic prose is beautifully written, and even taken by itself sweeps the reader along. But the aptness with which the prose points up the pictures—reinforcing, high-lighting, relating—is what makes both pictures and prose so effective and unique.

This is not simply an album of superb photographs. Nor is it just an illustrated statement of philosophy, although the philosophy is there. To do the book justice, the reader should start at the beginning and proceed, not merely scanning but absorbing the dual impact of each successive page. Only then will the force of the ideas build up and the book have the fullest opportunity to make its point: that our survival in

beauty and significance—in fact, existence itself—lies in our accepting responsibility for our American Earth as a heritage to be enjoyed while we hold it in trust for future generations.

Thoreau wrote that "only that day dawns to which we are awake". Here indeed is a glorious awakener.

ABIGAIL AVERY

Yankee Kingdom: Vermont and New Hampshire. By Ralph Nading Hill. New York: Harper & Brothers, 1960. 338 pages. \$5.95.

Mr. Hill, the author of *The Winooski* in the Rivers of America Series and other books and articles on the area, is well qualified to write a book on Vermont and New Hampshire for the Regions of America Series, edited by Carl Carmer. In *Yankee Kingdom* he has produced a readable and entertaining story.

In his prologue the author meets head-on Arnold Toynbee's famous statement that New Hampshire is north of "the optimum climatic area" and that Maine is merely the habitat of "woodmen and watermen and hunters". I recall vividly the repercussions in Maine over this heretical conclusion.

The book is well organized and compresses into its 338 pages an amazing amount of information about the area and its inhabitants, from the first settlement to the present day. Mr. Hill describes graphically the careers of such varied individuals as Ethan Allen and Mary Baker Eddy, Robert Rogers and Ethan Allen Crawford, Benning and John Wentworth and Daniel Webster, John Humphrey Noyes and Nicholas A. Briggs. He deals with such diverse subjects as the Republic of Vermont, the Indian Stream Republic, the exodus of farm population to the West in the period between the War of 1812 and the Civil War, industrial development and the decline of the textile industry, and the promotion of recreational and skiing resources. For the guidance of those who wish more detailed information on special subjects there is an excellent bibliography of fourteen pages.

Throughout the book there are brief references to the White Mountain region and its early settlement and history, but space limitations preclude any unified and extended treatment.

This is a valuable book on the New England scene—one that invites a more detailed study of the complex picture of the development of the area from its early history down to the present day.

LEROY D. CROSS

High Sheriff. Edited by Marjory Gane Harkness and Lilian C. McGrew. Tamworth, N. H.: published by Tamworth Historical Society, 1960. 198 pages. \$3.50.

Once again the Tamworth Historical Society has rescued for the permanent record some valuable and unique historical records, the reminiscences of a former sheriff of Carroll County who was highly respected throughout the State. Parts of these anecdotes appeared in APPALACHIA for December 1944 under the title of "A High Sheriff Looks Back", during the author's lifetime. James Welch (1877-1959) received a minimum of formal schooling but still retained the ability to reduce to writing the picturesque language and talk for which he was

renowned. Stories from the deep woods of Pittsburg, N.H., to the dusty depths of a second-hand furniture store in Boston's West End make Jim Welch's edited autobiography full of easy and informative reading. *High Sheriff* is genuine Granite State literature and should be a welcome addition to the library of any group or person collecting White Mountain lore.

C. F. BELCHER

The Meaning of Wilderness to Science. Proceedings, Sixth Biennial Wilderness Conference. Edited by David Brower. San Francisco: the Sierra Club, 1960. 130 pages, 48 pages of photographs, 5 large color cards, one end map. (No price given.)

In the series of wilderness conferences held by the Sierra Club it is an innovation to concentrate on the service by and to wilderness preservation of science, meaning here that complex of biologic studies which make up ecology. The first two papers, by an official of the National Park Service and a professorial critic respectively, stress the limited amount of basic research, which funds and interest permit, in the background information which the National Parks try to supply to the public. No one is yet ready to answer fundamental questions on the complex relationships involved in such seemingly simple problems as: Is there too much fire protection? Are there too many visitors? The third paper is a stimulating presentation of how much we do not know about our water resources.

The article on Alaska, to which most of the illustrations are attached, is largely a catalogue of its present and its needed public lands. This is followed by a statement, which was evidently accompanied by slides, of the need for studies of the mammals of the Canadian wilderness. Dr. Cowles makes a vivid case for reducing the pressure of population everywhere, and Dr. Fraser Darling supplements this by pointing out the dangers to wilderness from the reciprocal pressures of man and other animal life at the edges of any preserve, however large.

The volume concludes with the recommendations of the Conference on the problems presented and with a reprint of a lecture given in 1931 by G. M. Trevelyan in London. Compared to the hardheaded, though plentifully witty, papers of 1959, this seems a curiously old-fashioned and sentimental approach to the preservation of wilderness. The seven papers presented before the Sierra Club's Conference are a challenge to all our prior thinking about wilderness.

RUTH G. HARDY

The Story of Mount Desert Island, Maine. By Samuel Eliot Morison. Boston: Little, Brown and Co., 1960. xii, 81 pages, 15 illustrations, coast chart on jacket, bibliography, nomenclature. \$3.50.

Though small in size this book is not slight in substance. Though composed of random notes gathered over many years and put together for an informal lecture, it answers a thousand questions for whoever likes to see history behind the hills and harbors he visits. It is, first of all, readable—to be read at one sitting with appreciation both of its facts and of its flavor. That the facts are facts is guaranteed by its

author's unsurpassed reputation as a historian. Its flavor arises from his genial appreciation of people of every generation as individuals and from the warm glow of his still continuing acquaintance with a place where he has spent nearly seventy summers.

The book does not duplicate *The Story of Bar Harbor* by Richard Walden Hale, Jr. (New York: Ives Washburn, Inc., 1949), now, unfortunately, out of print. Later editions may well include a freshly drawn modern map of good scale, locating all the places mentioned in the text. The sketch-map on the cover and the coastal chart on the jacket of this edition do not satisfy this need adequately.

L. FELIX RANLETT

The Maine Islands in Story and Legend. By Dorothy Simpson. From material compiled by the Maine Writers Research Club. Philadelphia and N. Y.: J. B. Lippincott Co., 1960. 256 pages, 7 maps drawn by Guy Fleming, bibliography, appendix. \$5.50.

Primarily a reference book, this volume will also appeal to the vacationer who is wedded to the Maine coast or to the collector of the lore of Maine. If there are yachtsmen who gather islands, as climbers gather peaks, it will add to the reality of their quest.

The author is a writer of children's books of regional flavor. She is now a resident of Gay's Island in Muscongus Bay. She has lived all her life on one or another of the Maine islands. She has put together in a straightforward, unembellished way the stories and legends gathered by twenty-five members of the Maine Writers Research Club about twenty-nine individual islands or groups of islands. The arrangement is by areas, west to east along the Maine coast from the Isles of Shoals to St. Croix Island. There are good area maps and a first-class name index. Prominent among useful features is a fifteen-page list of tidewater islands, excluding vegetationless ledges unless occupied by manned lighthouses.

L. FELIX RANLETT

Mountaineering, The Freedom of the Hills. By The Climbing Committee of the Mountaineers, Seattle, Washington. Binghamton, New York: The Vail-Ballou Press, Inc., 1960. 430 pages, 16 pages of photographs and innumerable line sketches. \$7.50.

Mountaineering, The Freedom of the Hills is an outstanding book on the techniques of mountaineering. It is safe to predict that it will take its place along with such acknowledged benchmarks of excellence in this field as Henderson's *Handbook of American Mountaineering*. Every serious student of mountaineering techniques will want to read this book from cover to cover.

Mountaineering, The Freedom of the Hills, was written with a love for and an understanding of the mountains. The book is comprehensive. The careful attention to correctness of detail is always apparent, but especially in the illustrative sketches. If I had to select one thing that is especially noteworthy in this book, I would point to Chapter 15 on the subject of arrests and belays. A continuing thread of quiet, dry humor runs through the entire book.

In writing *Mountaineering* the Climbing Committee of the Mountaineers deserve the congratulations of the mountaineering world.

LYLE RICHARDSON

White-Water Sport. By Peter Dwight Whitney. New York: The Ronald Press, 1960. 117 pages, 28 drawings, 47 photographs. \$4.00.

While not an exhaustive manual, *White-Water Sport* is much more than an introduction to the subject of how to run rapids in kayak and canoe. There are sections on river configuration, on equipment and technique, on slalom, on club and trip management, on safety, and other topics. Some are covered more completely than others but the approach is always original and constructive.

The best chapter is the one on foldboat technique. This includes descriptions of the modern kayak strokes, such as paddle-brace stabilizing strokes, "Duffek" turns, and esquimautage. Heretofore the practitioners of these arts have not been able to describe them adequately. Whitney emphasizes the advantage of using these techniques with a narrow, rocker-bottomed kayak, and with the paddler firmly planted in his cockpit. The result is a fantastic agility in white water.

In the chapter on canoe technique a distinction is made between the "American" boat with its accompanying technique and the "European" boat and technique. The author explains some of both and makes a strong pitch for the European style. This involves a canoe with pronounced rocker, decked-in paddlers using forward steerage-way, paddle-brace strokes for stability, and pry-away strokes instead of the cross-draw. A.M.C. canoeists will register shock. However, open-minded study followed by practice should benefit our high-water capability.

Also worth special mention are the sections on foldboats and on associated equipment. These should prove useful to the beginner. The chapter on safety emphasizes the dangers of cold water.

The book is written in a professional style which encourages rapid reading. The illustrations are well chosen. In general, *White-Water Sport* should be an indispensable manual for the foldboatist and a recommended study for the canoeist.

ELIOT DUBOIS

Rock Climbs in Arran. By J. M. Johnstone. Edinburgh: The Scottish Mountaineering Club, 1958. 84 pages, 9 diagrams, one map. 3s. 6d.

The west coast of Scotland is graced by many mountainous islands to delight the climber who will brave their weather. Arran, lying in the Firth of Clyde and a well-known landmark on the western approach to Prestwick airport, is the most accessible and certainly not the least delightful of them. Its granite ridges provide splendid mountain walking and scrambling amid spectacular scenery; its great crags an inspiration to the rock climber. Yet the coarse-crystalled granite which yields such fine ridges and crags presents its own technical problems to the climber and it is only during the past twenty years or so that the main faces have yielded many fine routes.

This small guidebook, of a size to fit a jacket pocket, lists, describes and grades 90 rock climbs, crag by crag. The diagrams are good and the

enterprising (and competent) climber may wish to note the substantial areas of rock as yet untrodden. The grading is of the descriptive order and the routes are indexed as to both crags and order of difficulty.

This guidebook meets the needs of the rock climber admirably. It supplements but does not supplant the larger S.M.C. *Guide to The Islands of Scotland*, which remains the best general reference work for those of less specialized interests.

FRANK SOLARI

Guide to the Appalachian Trail: Susquehanna River to the Shenandoah National Park. Fifth Edition. Published by the Potomac Appalachian Trail Club, 1916 Sunderland Place, N.W., Washington, D. C., 1960. 288 pages. \$2.00.

This is one of three attractive, easy-to-handle volumes into which the rather cumbersome 1950 edition of *Guide to Paths in the Blue Ridge* has now been divided; the volume under review is the third in the group; it covers 167 miles of the AT.

Desirable features of previous editions have been retained: the sturdy cover will survive most pack conditions; pages are removable; each page shows the year of revision. Still followed is the familiar and useful pattern of dividing the trail into sections, usually bounded by highway crossings, and of giving both general and detailed information on each section. The table of contents has been simplified and "perishable" information, such as public transportation schedules, has been omitted, as well as information readily obtainable from other sources. No trail maps are included but they are available (eight in all) from the P.A.T.C.

A generous amount of historical data relating to the trail makes the *Guide* of greater interest to reader and walker alike. Particularly good is "History on the Trail" in the chapter on Pennsylvania. Harpers Ferry, now on an alternate of the AT, well deserves the separate chapter devoted to it.

The modestly captioned "Detailed Trail Data" paragraphs cover, almost foot by foot and in both directions, all important features along the trail and give distances, most of them measured by wheel and cyclometer, to one-hundredth of a mile. With such specific information the walker should be able to find his way even though standard trail-markings have been removed or obliterated. Not all trail data were re-checked for this edition but an obvious effort has been made to eliminate references to the "yellow house" and other such changeable landmarks.

References are sometimes—but not always—made to the amount of climbing on a section of trail, the difficulty of descents, roughness of footway, chance of excessive summer growth. Since these factors directly affect travel time might it not prove helpful to devote a paragraph to them in the general information preceding each section? Scattered throughout the text are references to the sources from which much interesting historical information is drawn. Would a separate listing of these sources, such as that given in the Pennsylvania section, be helpful to the arm-chair walker who may wish to pursue the subject further? It seems also that a brief section on trail-markings, precautions, use of fire, trail courtesy, etc., would be most helpful to the novice.

As the man says, "You can't watch the game without a score-card". AT walkers who want to know the score will need this *Guide*.

MURRAY S. CHISM

Guide to the Appalachian Trail in the Southern Appalachians. Fourth Edition. Washington, D. C.: Published by the Appalachian Trail Conference, 1916 Sunderland Place, N.W., Washington, D. C., 1960. 500 pages, several trail maps, index. \$3.75.

This fourth edition of the guide to the southern end of the Appalachian Trail brings up to date the trail data, including new relocations, from Damascus, Virginia, to the new southern terminus on Springer Mountain in the Chattahoochee National Forest, Georgia—a distance of 416.5 miles.

The guide contains general information concerning these southern mountains, the route and nature of the trail, its surroundings, methods of trail-marking, suggestions for extended trips, precautions to be taken and warnings concerning fire, hints on trail manners, and information regarding lean-tos, campsites and public accommodations. Finally, of prime value to the walker, a complete breakdown of each section of the trail mile by mile.

A particularly interesting chapter is a general description of the entire AT from Katahdin in Maine to Springer Mountain in Georgia.

PERCY L. PRESCOTT

A. M. C. White Mountain Guide. Sixteenth Edition. Published by the Appalachian Mountain Club, 5 Joy St., Boston, Mass., 1960. 494 pages, 17 maps. \$4.50.

A number of very basic changes feature the latest edition of the *Guide*. The most important is a revision of the order of chapters that puts the increasingly popular Mt. Washington and Presidential Range area at the front of the book, followed by the other more popular climbing areas, and ending with the outlying mountains in northern and southern New Hampshire. Other added improvements are an enlarged Franconia map in a new front-cover pocket, a modernization of chapter groupings in the changing Franconia-Pemigewasset wilderness section, a semi-flexible, plastic-coated cover, and completely new and uniform printing type. These changes and improvements, and the usual number of updated trail descriptions and facility locations, represent untold hours of volunteer work.

C. F. BELCHER

Selected Climbs in the Range of Mont Blanc. E. A. Wrangham, ed. London: George Allen and Unwin, 1957. 224 pages, 63 diagrams. 18 shillings.

This handy climbing guide, of special convenience to those climbers who prefer the English language to the French of the three-volume *Guide Vallot, Chaîne du Mont-Blanc*, has been compiled by members of the Alpine Climbing Group. Here are freely translated and adapted descriptions of 115 routes from among the many hundreds in the fuller

Guide Vallot. The route diagrams which are reproduced from the French guidebook show only the routes described and not the larger complex of other possible choices. On the whole, if reading the language is no problem, the *Guide Vallot* gives more information per ounce of carrying weight. *Selected Climbs*, with its larger type and much thicker paper, weighs nearly as much as one of the volumes of the French book, with perhaps a third as much information.

However, there is much to be said for *Selected Climbs*. Not only are the added bits of advice of value to foreigners, but the very fact that the climbs have been selected as the most desirable, and many of the variations omitted, will save the newcomer to Chamonix much confusion.

MIRIAM UNDERHILL

The Story of Mount Washington. By F. Allen Burt. Hanover, N. H.: Dartmouth Publications, 1960. 303 pages, 34 pages of illustrations. \$6.50.

Because of a rather peculiar combination of circumstances—the mountain's status as the apex of New England, its location in the northeast of the continent, and the particular altitude-bracket within which its summit lies—Mt. Washington has developed a triple personality. It is, in the first place, a climber's mountain, a climber's favorite mountain, as the highest peak in any considerable region must always be. But, in the second place, it is a tourist's mountain—indeed, a veritable mecca for tourists,—since it reaches far enough above timberline to offer a magnificent view while yet it does not breach the permanent snowline. And in the third place, having a relatively accessible summit in a region where it experiences some of the worst weather in the inhabited part of the world, it has become an important seat for scientific research.

These three characters are by no means entirely harmonious. Climbers are inclined to resent the presence on the summit of masses of people transported there by artificial means, and to deplore the disfiguring of the skyline by hotels, commercial installations, and large scientific laboratories, useful as these last in any case are. (The inconspicuous and very desirable observatory has always been an exception.) Tourists in general look upon climbers as a rather disreputable lot who ought properly to be segregated in restaurants and rest rooms, and feel not the slightest urge to go and do likewise. Scientists, engrossed in their important work, are annoyed by the pressure of tourists and climbers alike.

Since the three characters are discordant, it cannot be expected that any one man should be equally sympathetic with all of them or, consequently, equally well-informed about all. Yet a complete "story of Mt. Washington" should cover all three. I may sum up my own opinion of the present book as follows. As an account of Mt. Washington, the climber's mountain, I find it very inadequate. Mr. Burt shows far too little personal acquaintance with the mountain in this respect, and he is unfamiliar with much of the important source material. As an account of Mt. Washington, the tourist mecca, it is excellent. Mr. Burt is the grandson of Henry M. Burt, who founded and long edited the newspaper *Among the Clouds*, published on the summit for over thirty years, and the son of Frank H. Burt, the later editor. These men, by

profession, moved in the midst of the tourist activity and collected much valuable material dealing with it which the present author has inherited; in addition, his personal knowledge and experience in this tourist milieu are considerable. Finally, as an account of Mt. Washington, the seat of scientific activity, the book is good but not outstanding. Here again Mr. Burt has not been a personal participant, which rather hinders his story from really coming to life, but he knows and has made careful use of the available sources.

But a book of this importance deserves a detailed review under each of the heads mentioned.

(1) Speaking of Mt. Washington from the climbing viewpoint, Mr. Burt leads off, early in Chapter 1, with a colossal howler, one moreover which the publishers have chosen to feature by repeating it upon the dust jacket. He says (p. 4): "It [Mt. Washington] was the first great mountain to be climbed—anywhere in the world". Now, it seems a shame to turn heavy artillery upon a *papier-maché* statement of this sort, proffered without the slightest attempt at proof. However, since it is just possible that someone may be somewhat inclined to accord it some degree of credence, merely because it appears in print, here goes.

The first high-mountain ascent for which we have reliable authority was made by Philip V of Macedon and party in 181 B.C. To get a good view of the country for military reasons, he climbed "Mt. Haemus", by which was meant a chief peak of the Haemus Mountains, now the Stara Planina, in present-day Bulgaria. The higher peaks of this range are somewhat over 7000 feet in elevation. (Before this, to be sure, Hannibal's crossing of the Alps, in 218 B.C., had set an altitude record of 6000-7000 feet, depending on which pass he used.) Between this time and 1642, when Mt. Washington was first climbed, some two dozen peaks higher than it had been ascended, of which the following are the most important: Etna (10,700 ft.), by the Emperor Hadrian and party about 130 A.D.; Fujiyama (12,388 ft.), by Japanese tradition in 633; Adams Peak, Ceylon (about 7,400 ft.), in 1340, and undoubtedly earlier by pilgrims; Rochemelon (11,605), in the Graian Alps, in 1358; Mt. Sinai (8530 ft.), definitely in 1483 and often before, probably even in the 12th century, by pilgrims and Crusaders; Mont Aiguille (6880 ft.), in 1492, the first rock climb done with artificial aids; and the Peak of Teneriffe (12,200 ft.), in 1582.¹ Mt. Washington was not even the first peak of consequence to be climbed on this continent, for in 1521, over a hundred years earlier, a party of Cortez' soldiers, in the hope of obtaining from the crater some sulphur for the making of gunpowder, reached the top of Popocatepetl (17,887 ft.), nearly three times its height.²

Later on this howler acquires its mate. On page 124 we read: "For more than 200 years after Darby Field's ascent in 1642, no other great mountain in the world had been scaled. Exploring in the Alps commenced about 1850. . . ." Well, as it happens, "exploring in the Alps"

¹ See the detailed chronology by Walter Schmidkunz, a well-known mountaineer, in the German and Austrian Alpine Club's *Alpines Handbuch* (Leipzig, 1931), Vol. I, 307ff.; also, *Les Alpinistes Célèbres*, ed. Ségogne and Couzy (Paris, 1956), 12-15, and the Lonsdale *Mountaineering*, ed. Spencer, 17-19.

² Prescott, *Conquest of Mexico*, Book III, Chap. 8.

had commenced several hundred years earlier and between 1642 and 1850 some two hundred Alpine peaks higher than Washington were climbed, including several of the highest (Dent du Midi, Gross Glockner, Gross Venediger, Ortler, Jungfrau, Finsteraarhorn, and several summits of Monte Rosa). Mont Blanc, the highest of all, was climbed in 1786. 1850 is the date, not when Alpine mountaineering was born, but when it became fully of age.³

Mr. Burt's wellnigh perfect ignorance of the history of mountaineering is of course excusable, but that a book published by a university press should have been allowed to go out containing errors of this magnitude is hard to understand.

The early climbing history of Mt. Washington is disposed of by Mr. Burt in a very few pages. It is given incompletely, and without any of the quaint and delightful quotations from the original narratives which embellish F. W. Kilbourne's account in his classic *Chronicles of the White Mountains* (Boston and New York, 1916). To be sure, these could hardly have been introduced and commented upon without practically duplicating Kilbourne's account, and this Mr. Burt was very wise not to attempt, as his style is no match for Kilbourne's. He does, however, give an interesting picture of the life and work of the early Crawfords and Copps, with a much fuller use of the standard sources than we find in Kilbourne.

It is in the handling of the more recent climbing story that the book is most deficient.

In a history of Mt. Washington one might reasonably expect some information about the building and maintenance of its various huts, shelters and trails. There is almost nothing. The Pinkham Notch and Lakes-of-the-Clouds Huts, and the U.S.F.S. Tuckerman Ravine Shelter, all of which have interesting histories, get a mere mention (the last-named only in the Notes); the A.M.C. Hermit Lake Shelters and the one-time emergency shelter on the Crawford Path don't get even that. Very few trails are mentioned, nor is any reference on this subject given to the A.M.C. guidebook.⁴ Names of trail builders and dates of construction do not appear, save in one instance (the Tuckerman Ravine Trail); since however this information is no longer available in the guidebook it could well have been presented here. When Mr. Burt does mention a trail or shelter he sometimes makes a mistake: he locates the Edmands Path on the Northern Peaks (p. 204), and assigns the Great Gulf Shelter to the D.O.C. (p. 104).

The short chapter entitled "Climbing" contains very little indeed of what it ought to have. To take ordinary summer climbing, first of all, there are available very interesting early accounts of ascents of Huntington Ravine, the Great Gulf, and Oakes Gulf, none of which are given here. More surprising, since the items appeared in *Among the Clouds* itself, there is nothing about the various "record walks" which have

³ See, in addition to the references already given, W. A. B. Coolidge, *The Alps in Nature and History* (London, 1908), Appendix II.

⁴ When Mr. Burt does refer to the guidebook (quoting a warning on the dangers of Mt. Washington weather), he cites the 10th edition, 1936, although the 15th edition, 1955, was current at his time of writing and contains the same passage.

been made over the Presidential Range; whether actually records or not, many of these walks were mighty good ones. Then, a little research would have turned up some stories about people who have climbed Mt. Washington a phenomenal number of times, who have climbed it every month in the year, who have climbed it at a ripe old age, etc.

Climbs of a less usual sort, or under less usual conditions, are equally slighted. There are, to be sure, some accounts of winter climbs, scattered through the book instead of assembled under that heading, but Mr. Burt has missed some good stories of ascending the headwall of Tuckerman Ravine—and being carried down it in avalanches; and of traversing the entire Presidential Range on snowshoes and crampons. Ice climbing in the gullies of Huntington Ravine is referred to only as the setting for Jessie Whitehead's accident;⁵ nothing is told of the first ascent of the Odell Gully, or of the forbidding Pinnacle Gully which presents the most difficult climb on Mt. Washington. Rock climbing is something which is not mentioned in the book at all.

The chapter on skiing, where I discern the helpful contributing hand of Bob Monahan, is much the most complete in this whole department, but even here something is lacking. There is nothing on the original laying out and cutting of the ski trails, or on the methods of the Forest Service in the study and prevention of avalanches, or on the origin and activity of the volunteer ski patrol. Yet the boys who organized, and those who now carry on, this generous service deserve commemoration far more than dozens of the insignificant personalities whose names clutter the pages of the book.

On pages 138-140 occurs the book's worst blemish. Mr. Burt here repeats the high points of a fantastic story which appeared in the *Boston Post* for March 21, 1932. This story purported to be the account of a ski race run the preceding day down the full length of the carriage road, from summit to base, in a 70-mile gale; it described the intrepid skiers as "rocketing down the mountain at a speed sometimes in excess of 80 miles an hour", "facing death at every turn", to complete the 8-mile course in a little over 12 minutes. Now, the only elements of truth in this account were the mention of the time and the reference to the bad weather. The weather was indeed so bad that the proposed race down from the summit was canceled and a shortened course of only one-half the length, down from the Halfway House, substituted. Instead of "whizzing like human bullets down the mountainside" the skiers, due to the sticky snow, averaged less than 20 m.p.h. in taking 12 minutes for the 4 miles, their times thus falling far behind the record of a little over 8 minutes for this course.⁶ It is very difficult indeed to excuse the presence of this serious perversion of fact in a book which many people are sure to accept as authoritative and reliable. Even if Mr. Burt, from ignorance of Mt. Washington skiing conditions, was himself unable to detect the inaccuracy of this account when it first appeared in a sensational newspaper, he should at least have taken the precaution of

⁵ Incidentally, to document the story of this accident the reference given is merely to a newspaper account, instead of to the authoritative report by the participants and rescuers themselves.

⁶ See the *Berlin Reporter* for Thursday, March 24, 1932; also *APPALACHIA* for June 1932, p.153.

submitting it to a competent critic before accepting the responsibility of transmitting it.

Fatal accidents are covered only by way of a mere listing in the Notes, whereas Kilbourne had given a careful description and analysis of each one up to his time. Perhaps, since then, there have been too many to be dealt with in that fashion. But at least references should have been given to the full, basic accounts in all instances. Mr. Burt has missed one remarkable case of a near-fatality, a case which renders false his statement (p. 131) that in all the history of Mt. Washington there is none to match Dr. Ball's.⁷

(2) For the history of the building and maintenance of the railway, the carriage road, and the different summit hotels, and also of the changes of ownership of the railway and the summit property, Mr. Burt is in possession of much unusual source material, of which he makes good use. These chapters are highly recommended. He also has a good chapter on record runs up and down the carriage road, on bicycle and tricycle rides down it, and on record ascents by automobile. I could wish he had told us more about the ructions at the time when autos were first invading the White Mountains; during those days some interesting items appeared in *Among the Clouds*, including an editorial expressing the hope that the carriage road would never be opened to motor vehicles, and there must be many good stories that never appeared in print. I miss also an account of the great illumination of the skyline by red fire on the occasion of the opening of the present summit house.

(3) The important story with regard to Mt. Washington as a seat of scientific activity is that of the observatory and its research projects in peace and war. The tale of the first observatory is much better told by Kilbourne; that of the later one, with its extension down to the present, could have been improved by a more judicious selection of material from Monahan's book and the periodic observatory bulletins. Mr. Burt is all too prone to lose himself in the recitation of unimportant factual details, instead of conjuring up the general picture or projecting the vivid incident. The final chapters—on wartime experimentation, on radio and television installations, and on airplane landings at the summit—contain much good material which will be interesting news to most readers.

Among the many illustrations are some very interesting old photographs, and some striking modern ones by Harold Orne and Winston Pote. There is a good index—which, however (with one or two exceptions), does not include the Notes, a serious omission in a book which is bound to be much used for reference.

To sum up again. This is not the *complete* story of Mt. Washington, for a good third of the story, the mountain's climbing history, is so poorly told. And even in other respects the book by no means equals Kilbourne's admirable *Chronicles*. But it is the most important book on White Mountain history which has appeared since the *Chronicles*, and deserves to be placed on the shelf alongside that indispensable volume as a useful supplement to it.

ROBERT L. M. UNDERHILL

⁷ See APPALACHIA for June 1959, 385ff., "The Rescue of Max Englehart".

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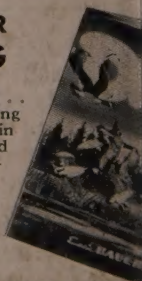
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